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ABSTRACT

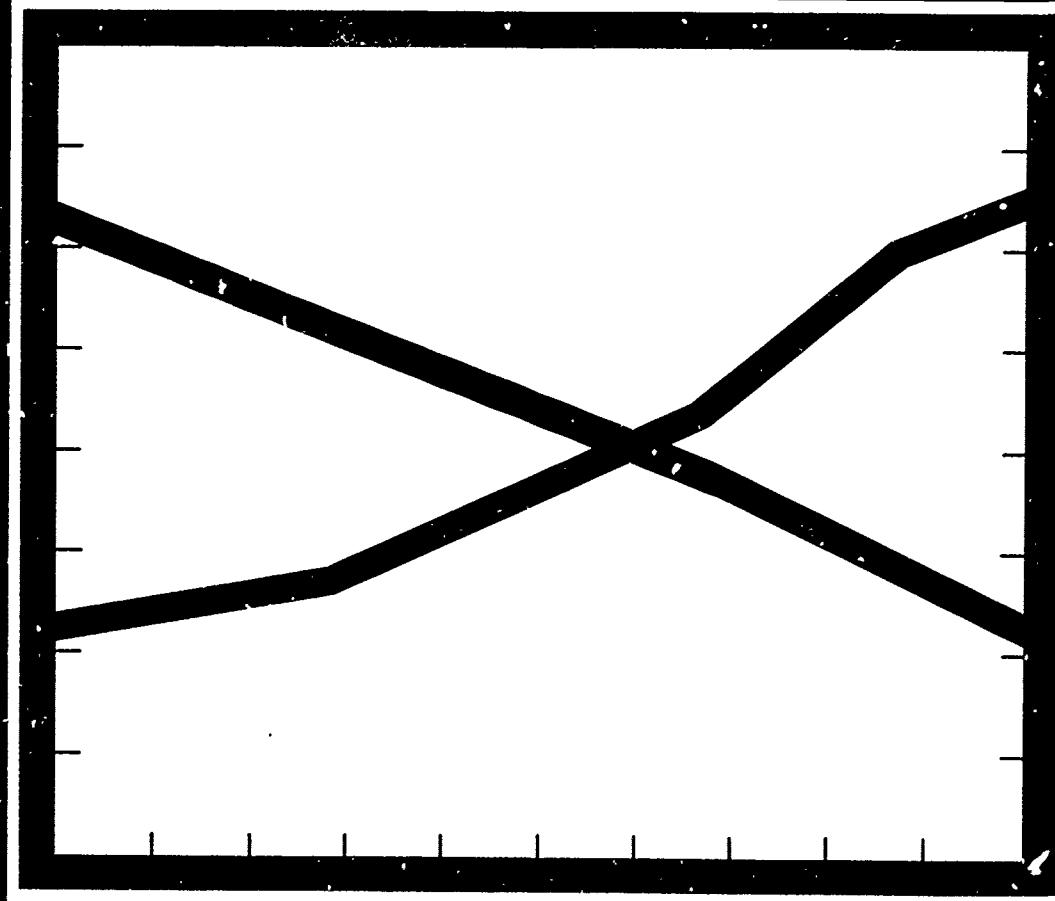
Through a comprehensive critical review of the empirical literature on health services utilization, there has been developed: (1) a classification of health services utilization, (2) a list of operational indices commonly used to measure each type of use, (3) a summary of the most powerful predictors of various types of use, and (4) a numbered bibliography with an abstract of each of the articles reviewed. (Author/CK)

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# The Utilization of Health Services: Indices and Correlates A Research Bibliography



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Health Services and Mental Health Administration, Public Health Service  
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**The Utilization of Health Services: Indices and Correlates**

**A Research Bibliography 1972**

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### List of Abbreviations

AFDC	Aid to Families with Dependent Children
AID	Automatic Interaction Detector
CHAS	Center for Health Administration Studies
CHS	Comprehensive Health Service
DNA	did not appear (for appointment)
DOV	doctor office visits
DPT	diphtheria-pertussin-tetanus
ER	emergency room
GHE	Group Health Association
GHDI	Group Health Dental Insurance
GHI	Group Health Insurance
GNP	Gross National Product
GP	General Practitioner
HIF	Health Information Foundation
HIP	Health Insurance Plan of Greater New York
HIS	Health Interview Survey
HSCORE	Health Status Score
ICDA	International Classification of Diseases
IMP	identifiable medical procedure
LHI	Labor Health Institute (St. Louis)
LPN	Licensed Practical Nurse
MAP	Medical Assistance Program
NCHS	National Center for Health Statistics

NORC	National Opinion Research Center
OAA	Old Age Assistance
OB-GYN	obstetrics-gynecology
DO	Doctor of Osteopathy
OEO	Office of Economic Opportunity
OPD	outpatient department
PAS	Professional Activity Study
PHN	Public Health Nurse
PSI	perceived susceptibility to illness
RN	Registered Nurse
SES	socio-economic status
SHC	Student Health Center
SMSA	Standard Metropolitan Statistical Area
SPANCOS	Veterans of the Spanish-American war, Boxer Rebellion and Philippine Insurrection.
TUSP	tendency to use services for psychosocial problems
UAW	United Auto Workers
USPHS	United States Public Health Service; (also PHS—Public Health Service)
VA	Veterans' Administration
WHO/ICS-MCU	World Health Organization/International Collaborative Study-Medical Care Utilization

## INTRODUCTION

A desire to assure widespread access to good health care at reasonable costs for people in the United States motivates public officials, medical care planners and administrators, physicians and social scientists. All are clamoring for dependable information on which to base national health care policy decisions.

The emergent national commitment to a more equitable distribution of health services, the evolution of new methods of financing medical services and the appearance of innovative modes of health care delivery have prompted a vigorous interest in the volume and patterns of health services utilization in the United States.

These demands have stimulated a flood of research on health services utilization in this and other countries within the last twenty years. However, the conclusions about the patterns of use and their determinants to be drawn from the literature are far from clear. The specific measures of utilization employed by researchers, the populations observed, sampling procedures, methods of data collection and analysis have been combined in such heterogeneous ways that few studies are truly replicative. For this reason the cleansing of the literature which normally occurs in science has not taken place. Highly suspect findings cannot be discounted finally, and confusion results as they continue to be cited.

If the findings that already exist are to serve as a foundation for public officials and planners in deciding national health care policy and as a meaningful guide for researchers in generating additional research on health services utilization, and if the consumer of health services is to benefit ultimately, then the introduction of some order in the studies of utilization is essential. The introduction of that order is the primary purpose of this report.

Through a comprehensive critical review of the empirical literature on health services utilization, we have developed (1) a classification of health services utilization, (2) a list of operational indices commonly used to measure each type of use, (3) a summary of the most powerful predictors of various types of use and (4) a numbered bibliography with an abstract of each of the articles reviewed. Throughout this report numbers in parentheses refer to the articles abstracted in the bibliography.

Each article reviewed was approached with the following questions in mind:

**A. Population and/or sample**

1. Is it a national sample?
2. If it is a local study, is the sample sufficiently large? representative?

**B. Method of data collection**

1. Is the instrument for collecting the data appropriate for the information sought and the population sampled?

2. Are the field methods appropriate?

**C. Method for data analysis**

1. Are the statistics used appropriate for the method of sampling and the techniques for data collection?

2. Are they overly simple or complex?

3. Does the method of analysis provide for the control of extraneous variables?

**D. Findings**

1. How large are the differences? Are they statistically and/or practically significant?

2. Are the findings relatively unqualified?

3. Do they agree with findings from other studies?

When relationships of the correlates to use were found, these criteria permitted us to select the most significant articles.

In ordering the numerous measures and predictors of utilization, we have built on schema that presently exist. Our classification of the utilization variable itself elaborates O. W. Anderson's typology of personal health services utilization (17) while R. Andersen's model of predisposing, enabling and need components serves to systematically categorize the numerous predictors of use (9).

This report consists of four sections. Section 1 is "A Classification of and Key to the Indices and Correlates of Utilization." This section presents our typology of use, lists the indices that appear in the literature for each category and classifies the correlates of utilization by predisposing, enabling and need components. We remind the reader again that here, as throughout this report, the numbers in parentheses refer to the number of the article in the bibliography where these variables are discussed.

Section 2 is a tabular summary of the indices of utilization and most important trends in the use of health services, described in the literature.

Section 3 is a tabular summary of the correlates of utilization with significant findings which relate these correlates to the indices of use and elaborate their utility in predicting utilization.

Section 4, the bibliography, provides a comprehensive abstract of each of the articles reviewed. The abstract includes information on the purpose of the study, population and/or sample, method of data collection,

indices and correlates of utilization, method of data analysis and a summary of findings and interpretations.

Utilization of health services is not a simple concept, as Anderson (17), Anderson and Andersea (18), Bice and White (31), Greenlick and Freeborn (67), Greenlick (193), Kovner (84) and Solon (182) point out. Too often investigators have not specified what they mean by utilization. The term can, at least, refer to the following facets of the delivery of care: (a) type of service — physician, hospital, dentist; (b) volume of services — number of visits, hospital admissions; (c) components of the service — provider, place, time; (d) purpose of the service — medical, surgical, obstetrical; (e) discretionary

or coercive — free choice of service or service required as a condition of employment, for instance. (f) unit of measurement — individuals or group.

In summary, the provision of a rigorous ordering of utilization indices and correlates is a response to the evident complexity of health services utilization. Such a classification, together with the substantive findings presented in the bibliography, and summarized in tabular fashion, will permit the researcher to match more confidently and efficiently his research questions with an appropriate measure of use, and, further, will permit him to select from the array of correlates those which are the most powerful predictors of use.

## Section 1: A CLASSIFICATION OF AND KEY TO THE INDICES AND CORRELATES OF UTILIZATION

### INDICES

#### 1. Physician Utilization

##### A. Volume of visits

1. Time interval since last physician visit  
(27, 79, 100, 102, 120, 121, 126, 127, 128, 131, 158, 177)
2. Physician visit within past two weeks  
(29, 32, 64, 164, 166)
3. Physician visit within past month  
(3, 65)
4. Physician visit within past twelve months  
(2, 10, 29, 33, 82, 102, 109, 121, 164, 166)
5. Total number of physician visits per person per year  
(9, 19, 22, 33, 43, 52, 60, 80, 85, 104, 147, 150, 155, 191, 203, 204)
6. Mean number of physician visits per person per year  
(10, 13, 24, 30, 96, 99, 100, 101, 109, 111, 114, 115, 119, 120, 121, 122, 158, 160, 171, 173, 177, 179, 185, 187)
7. Mean number of physician visits per person-year  
(10, 18, 21)
8. Physician visits per 100 persons per year  
(68, 148, 180, 196)
9. Physician visits per 1000 persons per year  
(72, 153)
10. Physician visits per 1000 exposure-years  
(24)
11. Physician consultation index  
*observed yearly number of consultations divided by mean yearly number of consultations for all persons of the same age and sex*  
(146)
12. Proportion having at least one physician visit during the year  
(13, 18, 19, 21, 68, 82, 83, 198)
13.  $U = \frac{n-a}{k}$  = deviation from the national averages in the percent of the family that has visited a physician

the previous year, where

$n$  = number of family members who have seen a physician in the past year

$a$  = national average for the number of family members who have seen a physician in the past year for a family of the same size, age, and sex composition

$k$  = size of family  
(1)

14. Number of physician visits per family or unrelated individuals per year  
(118)

15. Physician visits per 100 families or unrelated individuals per year  
(118)

16. Family units of physician use based on visits and in-hospital surgical procedures, weighted by the California Relative Value Scale (in dollars)  
(9, 11)

17. Total expenditures per family (or per individual) for physician's services  
(18, 22, 74, 99, 104, 106, 115)

##### B. Site of visit — home, office, hospital, clinic, telephone, etc.

(1, 3, 5, 10, 17, 24, 25, 41, 60, 62, 64, 80, 84, 85, 86, 93, 99, 101, 109, 111, 115, 119, 121, 141, 145, 147, 158, 164, 165, 166, 177, 180, 196, 197, 198, 204)

##### C. Time of visit — regularly scheduled, walk-in, etc.

(68, 69, 86, 141, 149, 164, 166, 197)

##### D. Type of visit

1. Surgical
  - a. In-hospital
    - (1) Surgical procedure rate per 100 persons per year  
(4, 17, 18, 19, 21)

- (2) Surgical procedure rate per 100 person-years  
(<sup>c</sup> '0, 17, 18, 21)
- b. Out-of-hospital
  - (1) Surgical procedure rate per 100 persons per year  
(17, 19)
  - (2) Number of ambulatory surgery procedures per 1000 exposure-years  
(24)
- 2. Medical
  - a. General physical exam
    - (1) Time interval since last general physical exam  
(10, 27)
    - (2) General physical exam within past month  
(65)
    - (3) General physical exam within past twelve months  
(2, 10, 29, 33, 60, 80, 85, 102, 198)
    - (4) Reason for general physical exam — preventive, symptom, required  
(9, 10, 18, 29, 50, 60, 80, 82, 85)
  - b. Preventive-service visit
    - (1) Voluntary participation in medical screening programs (chest X-rays, TB tests, etc.)  
(34, 55, 96, 174, 194, 207)
    - (2) Number of preventive immunizations received  
(94, 95, 201)
    - (3) Percent receiving preventive immunizations (polio, smallpox, etc.)  
(28, 34, 37, 42, 47, 61, 66, 165, 181, 190, 192, 201, 202)
    - (4) Preventive service visit rate per 100 persons  
(4)
    - (5) Preventive service visit rate per 1000 exposure-years  
(24)
    - (6) Preventive service users per 1000 exposure-years  
(24)
  - (7) Proportion of visits for preventive services  
(82, 101, 158, 165, 171, 198)
  - c. Illness-related visit
    - (1) Visiting a physician in response to symptoms of illness  
(3, 9, 10, 14, 16, 60, 80, 82, 85, 93, 157, 164, 196)
    - (2) Illness visit rate per 100 persons  
(4)
    - (3) Physician calls per 1000 bed days of illness  
(72)
  - d. Ancillary services — diagnostic X-rays, laboratory services, etc.  
(24, 60, 80, 85, 99)
  - 3. Obstetrical
    - a. Time of initiation of medical care contact  
(10, 18, 21, 34, 48, 138, 139, 147, 195, 202, 205, 206)
    - b. Number of pre-natal visits  
(10, 18, 21, 34, 40, 48, 138, 201)
    - c. Content of pre-natal care  
(48, 138, 139)
    - d. Medical attendant at birth  
(16, 201)
    - e. Postpartum care  
(34, 40, 206)
  - E. Type of physician specialty
    - 1. General practitioner, specialist, etc.  
(10, 17, 24, 52, 68, 71, 82, 83, 96, 99, 109, 115, 158, 206)
    - 2. Nurse visits as substitute for physician's services  
(10, 60, 80, 85, 173, 187)

II. Hospital Utilization

  - A. Volume of services
    - 1. Admissions and/or discharges
      - a. Number of hospitalized illness episodes  
(10, 29, 56, 59, 103, 119, 120, 122)
      - b. Hospital admission rates per 100 person-years  
(10, 18)
      - c. Hospital admission (or discharge) rate per 100 persons per year  
(4, 19, 20, 21, 41, 86, 97, 98, 100, 112, 114, 120, 122, 158, 198, 204)

## Section 1: A Classification of and Key to the Indices and Correlates of Utilization

- d. Hospital admission (or discharge) rate per 1000 persons per year
  - (12, 15, 18, 20, 29, 44, 45, 49, 81, 90, 96, 99, 103, 108, 109, 111, 116, 121, 131, 132, 133, 134, 136, 137, 145, 152, 153, 161, 162, 153, 177, 200, 204)
- e. Hospital admission (or discharge) rate per 100,000 persons per year
  - (44)
- f. Proportion admitted to a hospital
  - (3, 5, 13, 59, 62, 65, 185, 204)
- g. Hospital discharges per 100 families
  - (118)
- 2. Length of stay
  - a. Total number of hospital days per person per year
    - (9, 13, 18, 46, 52, 56, 59, 60, 80, 96, 103, 116, 120, 150, 155, 156, 179, 185, 203)
  - b. Mean length of stay per hospital admission (or discharge)
    - (10, 12, 15, 18, 19, 20, 21, 41, 44, 45, 46, 49, 56, 62, 71, 81, 90, 97, 99, 108, 109, 112, 121, 122, 123, 124, 125, 127, 128, 132, 133, 134, 135, 137, 143, 152, 153, 161, 170, 198, 200)
  - c. Patient days per 100 person-years
    - (10, 21)
  - d. Patient days per 100 persons per year
    - (19, 44, 45, 54, 56, 114, 198, 204)
  - e. Patient days per 1000 persons per year
    - (15, 41, 81, 90, 96, 133, 134, 136, 144, 145, 152, 161, 163, 176, 200, 204)
  - f. Patient days per calendar day
    - (8)
- 3. Expenditures
  - a. Family units of hospital use based on days, type of accommoda-
  - tions and type of admission, weighted by daily service charges (in dollars)
    - (9)
  - b. Total expenditures per family (or per individual) for hospital services
    - (9, 10, 12, 18, 22, 56, 74, 99, 104, 106)

4 Occupancy rate – including the number of beds occupied per 10,000 population, the ratio of the number of patient days to the number of bed days, etc.

- (132, 133, 134, 135, 136, 176)

B. Type of hospital

- (123, 124, 125, 132, 133, 134, 135, 136, 137)

- 1. By service
  - a. Short-stay general hospital
  - b. Chronic disease hospital
  - c. Geriatric hospital
  - d. Mental hospital
- 2. By ownership
  - a. Proprietary
  - b. Nonprofit
  - c. Government

C. Type of services

- 1. In-patient accommodations
  - (9, 17, 20, 56)
  - a. Private room
  - b. Semi-private room
  - c. Ward
- 2. Outpatient department visits
  - (13, 156, 160, 183, 201)
- 3. Emergency room visits
  - (89, 159, 172, 199)
- 4. Ancillary services – operating room, delivery room, laboratory, radiology, etc.
  - (17, 56)

D. Type of admissions

- 1. Medical
- 2. Surgical
- 3. Obstetrical

III. Dentist Utilization

A. Volume of services

- 1. Time interval since last dentist visit
  - (23, 50, 58, 87, 88, 99, 100, 107, 121, 122, 140, 158)
- 2. Dentist visit within past twelve months
  - (10, 13, 18, 19, 21, 29, 48, 58, 86, 87, 88, 107, 140, 141, 142, 185, 191)

3. Mean number of dentist visits per person per year  
     (17, 18, 99, 100, 105, 111, 120, 121, 122, 137, 151, 173, 185, 198, 203, 204)

4. Number of persons using services per 100 person-years  
     (140)

5. Number of dentist visits per family or unrelated individuals per year  
     (118)

6. Total expenditures per family (or per individual) for dentist services  
     (9, 10, 11, 18, 22, 99, 104, 106, 142)

B. Type of service

- 1. Restorative  
         (17, 58, 99, 105, 140, 158, 190)
  - a. Extractions
  - b. Fillings
  - c. Crowns, bridges, dentures
- 2. Preventive  
         (50, 58, 76, 78, 99, 105, 158, 185, 190)
  - a. Prophylaxis
  - b. Examination

C. Type of dentist specialty  
     (17, 25, 58, 87, 88)

**IV. Nursing and Personal Care Homes**

A. Volume of services  
     (17, 71, 123, 125, 126, 127, 128, 179)
 

- 1. Number of admissions
- 2. Length of stay

B. Type of services  
     (123, 125, 126, 127, 128)
 

- 1. Nursing care
- 2. Personal care with nursing
- 3. Personal care

**V. Drugs and Druggists**

A. Drugs

- 1. Number of
  - a. Prescribed drugs  
         (13, 17, 110, 113, 150, 204)
  - b. Non-prescribed drugs  
         (17, 32, 110, 113, 150)
- 2. Expenditures for
  - a. Prescribed drugs  
         (10, 18, 22, 99, 106, 110, 113, 203)
  - b. Non-prescribed drugs  
         (10, 18, 22, 106, 113)

B. Druggists  
     (10, 83)

**VI. Appliances**

- A. Corrective lenses and eye care  
         (10, 19, 21, 112, 117, 204)
- B. Hearing aids, trusses, braces, crutches, artificial limbs, walkers, wheelchairs, etc.  
         (17, 99, 104, 129, 204)

**VII. Other**

- A. Home care services  
         (34, 70, 150, 177)
- B. School health services  
         (34, 35, 36, 57)
- C. Private duty nursing  
         (17)

**VIII. Indices of Total Utilization**

- A. Mean number of medical care contacts per person per year  
         (59, 65, 165)
- B. Indices of individuals' or families' total utilization of health care services  
         (3, 5, 16, 24, 67, 68, 147, 148)
- C. Indices of individuals' or families' total expenditures for health care services  
         (9, 22, 53, 67, 74, 96, 99, 104, 106)

## CORRELATES

### I. Predisposing Variables

#### A. Socio-demographic correlates

- 1. Age  
     (2, 9, 10, 11, 13, 14, 15, 17, 18, 20, 21, 22, 24, 32, 36, 40, 41, 43, 44, 45, 50, 52, 53, 55, 56, 59, 68, 74, 79, 82, 90, 92, 95, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 126, 127, 128, 129, 131, 132, 133, 134, 135, 136, 137, 138, 139, 141, 142, 143, 147, 148, 150, 155, 156, 158, 171, 173, 174, 177, 183, 191, 192, 197, 198, 202, 203, 204)
- 2. Sex  
     (10, 13, 14, 17, 18, 20, 21, 24, 32, 33, 41, 43, 44, 45, 52, 53, 56, 68, 74, 79, 90, 92, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 119, 120, 121, 122, 123, 126, 127, 128, 129, 131, 132, 133, 134, 135, 136, 137, 141, 143, 150, 171, 174, 177, 183, 191, 192, 197, 203, 204)

## Section 1: A Classification of and Key to the Indices and Correlates of Utilization

- 3. Education
  - (2, 9, 10, 11, 13, 14, 15, 17, 25, 26, 29, 33, 35, 36, 37, 40, 41, 47, 48, 50, 52, 53, 55, 56, 58, 78, 88, 92, 94, 95, 101, 102, 104, 105, 106, 107, 108, 110, 115, 117, 118, 138, 147, 148, 149, 155, 156, 159, 171, 173, 174, 186, 191, 202, 203, 207)
- 4. Martial status
  - (9, 13, 14, 24, 40, 52, 53, 55, 56, 101, 102, 105, 108, 115, 130, 132, 133, 134, 135, 136, 155)
- 5. Family size and composition
  - (2, 9, 11, 13, 24, 26, 36, 40, 43, 52, 53, 79, 92, 95, 99, 103, 106, 110, 116, 118, 131, 146, 155, 173, 174, 186, 203)
- 6. Race or ethnicity
  - (1, 6, 9, 10, 11, 13, 15, 16, 25, 26, 35, 36, 47, 55, 56, 94, 95, 101, 102, 103, 105, 106, 107, 108, 110, 115, 116, 118, 119, 121, 123, 132, 133, 134, 135, 136, 137, 138, 139, 141, 147, 148, 158, 159, 173, 174, 183, 190, 191, 192, 202, 207)
- 7. Religious preference
  - (25, 36, 40, 55, 174, 207)

Social-psychological correlates

- 1. General health care attitudes
  - a. Health beliefs and medical orientation
    - (9, 17, 30, 37, 55, 57, 66, 79, 86, 87, 88, 93, 95, 147, 148, 149, 151, 174, 181, 188, 195, 203, 207)
  - b. PAC (perceived availability of care) (29, 33)
  - c. TUSP (tendency to use services of a physician)
    - (29, 32, 33)
  - d. Skepticism of medical care and physicians
    - (2, 9, 29, 93, 149)
- 2. Knowledge and sources of health care information
  - (9, 17, 23, 34, 36, 37, 42, 48, 61, 149, 174, 181)
- 3. Situation-specific stresses
  - a. Perceived susceptibility
    - (23, 55, 75, 76, 77, 78, 168, 169, 194)
  - b. Perceived seriousness
    - (7, 29, 36, 75, 76, 77, 78, 157, 168, 169, 194, 199)
  - c. Perceived chance of recovery
    - (23, 26, 75, 76, 77, 168, 169, 194)
  - d. Psychological readiness
    - (27, 30, 168, 194)

4. Generalized stresses

- a. Psychological
  - (1) Upsetting events, crises, chronic stresses
    - (3, 5)
  - (2) Fear, worry, anxiety, etc.
    - (23, 26, 60, 78, 87, 88, 148)
- b. Structural
  - (1) Social isolation - powerlessness, anomie
    - (26, 92, 93, 94, 95, 149)
  - (2) Broken or intact family
    - (201, 205)

5. Patient-physician interaction

- (20, 38, 39, 52)

C. Previous health behavior

- (2, 11, 55, 58, 61, 78, 79, 87, 88, 95, 139, 147, 148, 195, 202, 207)

**II. Enabling Variables**

A. Economic correlates

- 1. Socio-economic status and occupation
  - (1, 9, 11, 13, 14, 15, 24, 25, 26, 30, 32, 34, 35, 36, 42, 47, 55, 56, 61, 65, 66, 74, 78, 79, 83, 86, 89, 92, 94, 95, 106, 140, 141, 142, 146, 149, 151, 153, 155, 156, 159, 164, 166, 167, 181, 183, 190, 195, 196, 197, 206, 207)
- 2. Income
  - (2, 6, 9, 10, 11, 13, 14, 15, 18, 21, 22, 23, 25, 26, 28, 29, 30, 33, 35, 41, 44, 47, 48, 49, 52, 53, 55, 56, 57, 58, 73, 82, 85, 86, 87, 88, 89, 92, 93, 96, 97, 99, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 115, 116, 117, 118, 119, 121, 138, 149, 150, 156, 157, 158, 171, 185, 191, 192, 198, 202, 203)
- 3. Price of medical services
  - (2, 9, 11, 17, 26, 29, 30, 33, 52, 53, 59, 60, 73, 156, 170)

4. Methods of financing

- a. Third-party payors
  - (1) Voluntary insurance  
(2, 6, 9, 10, 13, 17, 18, 20, 21, 24, 26, 29, 30, 32, 33, 35, 46, 49, 52, 53, 56, 70, 74, 82, 85, 97, 99, 106, 143, 144, 155, 157, 174, 203, 204)
  - (2) Medicare, Medicaid, welfare  
(2, 8, 9, 13, 26, 29, 30, 33, 39, 64, 70, 93, 125, 142, 157, 160, 165, 173, 175, 180, 185, 205)
- b. Type of coverage — indemnity, Blue Cross-Blue Shield, major medical, etc.  
(46, 74, 81, 82, 90, 143, 144, 155, 200)
- c. Method of payment — fee-for-service, pre-payment, etc.  
(19, 44, 45, 64, 80, 81, 85, 140, 141, 144, 145, 153, 160, 163, 179, 191)

B. Organizational correlates

- 1. Alternative organizational forms
  - a. Prepaid group practices
    - (1) Columbia Medical Plan — Columbia, Maryland  
(145)
    - (2) Health Insurance Plan of Greater New York, Inc. (HIP) — New York City  
(19, 43, 44, 45, 55, 81, 179, 180)
    - (3) Kaiser Foundation Health Plan, Inc. — Oregon-California  
(67, 68, 69, 71, 81, 141, 149, 196, 197)
    - (4) Ross-Loos Medical Group — Los Angeles, California  
(80, 85)
  - b. Prepaid dentist plans — Group Health Dental Insurance, Inc. (GHDI) — New York City  
(140)
  - c. Solo fee-for-service plans
    - (1) Group Health Insurance, Inc. (GHI) — New York and New Jersey  
(19, 24, 45)
    - (2) San Joaquin Foundation — Stockton, California  
(80, 85)

(3) Windsor Medical Services — Windsor, Ontario, Canada  
(41, 81)

d. Comprehensive health care plans for low income enrollees
 

- (1) Comprehensive child care program — Boston, Massachusetts  
(4)
- (2) Cornell Welfare Project — New York City  
(62, 63)
- (3) OEO neighborhood health centers  
(157, 173, 185, 187)

e. Cross-national comparisons — U.S., Sweden, Canada, etc.  
(12, 13, 14, 31, 90, 152, 153)

2. Type of practice — solo or group practice  
(17, 19, 35, 44, 45, 80, 81, 85, 144, 145, 153, 179, 191)

C. Availability of services

- 1. Region  
(9, 13, 56, 101, 102, 103, 105, 106, 107, 108, 109, 110, 111, 115, 116, 118, 121, 125, 128, 131, 133, 137, 138, 139, 143, 148, 192, 204)
- 2. Residence (rural-urban)  
(9, 10, 11, 13, 14, 15, 17, 18, 21, 22, 24, 52, 56, 101, 102, 103, 105, 106, 107, 108, 109, 110, 111, 115, 116, 118, 121, 138, 139, 150, 204)
- 3. Distance  
(1, 25, 29, 30, 55, 56, 72, 95, 156, 159, 173, 178, 196, 197, 202)
- 4. Supply of medical personnel and facilities
  - a. Physician-population ratio  
(9, 29, 49, 54, 56, 150, 162, 204)
  - b. Hospital bed-population ratio  
(9, 15, 49, 53, 150, 161, 176, 204)
- 5. Regular source of care  
(9, 11, 29, 32, 33, 48, 157, 165, 183)

III. Need

A. Health and mobility status  
(9, 11, 13, 55, 59, 79, 80, 126, 127, 128, 129, 131, 147, 148, 150)

**Section 1: A Classification of and Key to the Indices and Correlates of Utilization**

- B. Perceived symptoms of illness  
(3, 5, 9, 10, 13, 30, 52, 59, 82, 93,  
157)
- C. Physician-rated urgency  
(7, 89, 157, 159, 172, 199)
- D. Chronic activity limitation status  
(29, 33, 60, 68, 80, 101, 106, 110,  
115, 126, 127, 128, 129, 131, 150,  
185, 197)
- E. Disability days  
(9, 13, 29, 32, 96, 150)
- F. Diagnosis  
(8, 20, 24, 45, 56, 60, 68, 71, 90, 99,  
101, 108, 109, 113, 132, 133, 134,  
135, 136, 137, 170, 197)
- G. Surgery  
(4, 9, 10, 17, 18, 20, 21, 24, 45, 56,  
108, 111, 132)

## Section 2: INDICES OF UTILIZATION

INDICES	SELECTED TRENDS
<ol style="list-style-type: none"><li>1. Physician Utilization: The main categories of physician use are volume of visits, site of visit, time of visit, type of visit, and type of physician specialty.<ol style="list-style-type: none"><li>A. Volume of visits:<ol style="list-style-type: none"><li>1. These indices indicate whether or not an individual has seen a physician and how long since he made the visit: time interval since last physician visit; physician visit within past two weeks; physician visit within past month; and physician visit within past twelve months.</li><li>2. These measure the volume of particular individuals' physician visits through time: total number of physician visits per person per year; mean number of physician visits per person per year; and mean number of physician visits per person-year.</li><li>3. These are aggregate measures of use for groups of individuals: physician visits per 100 persons per year; physician visits per 1000 persons per year; physician visits per 1000 exposure-years; physician consultation index (obtained by dividing the observed yearly number of consultations by the mean yearly number of consultations for all persons of the same age and sex); and the proportion having at least one physician visit during the year.</li><li>4. These are measures of the volume of physician services consumed by families: the deviation from national averages in the percent of the family that has visited a physician in the previous year; number of physician visits per family or unrelated individuals per year; and physician visits per 100 families or unrelated individuals per year.</li><li>5. Expenditures for physician services, which reflect both price and utilization components, are used to gauge both individuals' and families' demand for physician services.</li></ol></li></ol></li></ol>	<p>The years from 1928 to 1958 showed the greatest increase in the volume of physician services used in the U.S. In 1928-31, 2.6 physician visits per person were reported; in 1957-58 there were 4.7 physician visits per person per year. During the 1928-31 period, approximately 60 percent of the population did not seek physicians' services during the year; in 1957-58 more than 60 percent did see a physician (17,100).</p> <p>Since 1958 the mean number of physician visits per person per year has declined, and the proportion of the population seeing a physician continued to increase, though at a lesser rate. For example, in 1963-64, there were 4.5 physician office visits per person per year and 4.3 visits per person in 1969 (101,122). In 1963-64, 66 percent of the population had seen a physician and in 1969 the proportion had climbed to 69.4 percent (102,122).</p>

INDICES	SELECTED TRENDS
B. Site of visit: patient's home, physician's office, hospital, clinic or telephone consultation.	The proportion of physician visits occurring in offices increased from approximately 61 percent in 1957-58 to 71.8 percent in 1966-67. Further, greater use is being made of physician services in hospital emergency rooms, clinics and by telephone contact (115).
C. Time of visit: This index permits refinement of the sequence of physician-seeking behavior. For example, is it an initial contact or a follow-up visit? Is it a scheduled visit or a walk-in appointment?	
D. Type of visit: surgical, medical and obstetrical.	
1. Surgical: in- or out-of-hospital.	
a. In-hospital: surgical procedure rate per 100 persons per year; surgical procedure rate per 100 person-years.	The hospitalized surgical-procedure rate has remained fairly stable in recent years — 5 per 100 person-years, but the case mix has changed because of the development of new surgical techniques (18).
b. Out-of-hospital: surgical procedure rate per 100 persons per year; number of ambulatory surgery procedures per 1000 exposure-years.	
2. Medical: general physical exam, preventive service visit, illness-related visit, and ancillary services.	
a. General physical exam: time interval since last general physical exam, general physical exam within past month, and general physical exam within twelve months; reason for seeking general physical (preventive, symptom, required).	A 1963 nationwide survey showed that over one-half of the sample had a general physical exam within the year. Thirty-nine percent reported symptoms as the factor initiating the exam; for 32 percent the exam was required; and 29 percent who reported having a checkup were free of symptoms (18).
b. Preventive service visit: voluntary participation in medical screening programs; number of preventive immunizations received; percent of persons receiving preventive immunizations; rates such as preventive service visit rate per 100 persons; preventive service visit rate per 1000 exposure-years; preventive service users per 1000 exposure-years, and the proportion of visits for preventive services.	A 1963-64 National Center for Health Statistics survey reported that 81 percent of physician visits were for diagnosis and/or treatment of an illness or injury. Eight percent were for general exams and five percent for vaccinations. The remainder were for obstetrical care (101).
c. Illness-related visit: visiting a physician in response to symptoms of illness; illness visit rate per 100 persons; and physician calls per 1000 bed days of illness. In addition, a need-use ratio (number of physician visits per 100 bed days, restricted activity days, and school loss days) has been introduced in unpublished National Center for Health Services Research and Development data.	
d. Ancillary services: such as diagnostic X-rays, laboratory services.	Increasingly physicians are providing diagnostic X-rays, laboratory and other ancillary services in their offices and outpatient clinics (24, 60, 80, 85, 99).

INDICES	SELECTED TRENDS
<p>3. Obstetrical: time of initiation of medical care contact (month of pregnancy in which first visit was made; number of prenatal visits; content of the prenatal care (exam, X-ray, for example); whether there was a medical attendant at birth; and whether the mother sought postpartum care.</p> <p>E. Type of physician specialty: general practitioner or medical specialist; nurse visits as substitute for physician's services.</p>	<p>Trends suggest that increasing use is being made of obstetrical services. The proportion receiving care early in pregnancy increased sharply between 1953 and 1958 and leveled off by 1963. In 1953, 38 percent had seen a physician by the end of the second month of their pregnancy; in 1958 this percent rose to 51 percent and to 52 percent in 1963. Similarly, the median number of prenatal visits for live births increased from 8.4 in 1953 to 9.8 in 1958 and 10.5 in 1963. In 1953, 95 percent of the live births were attended by a physician; in 1958 the proportion had risen to 99 percent, and in 1963 a nationwide survey showed that all live births were attended by a physician (10).</p> <p>A 1963 survey showed that 41 percent of the population had a general practitioner as a regular source of medical care and 31 percent had a specialist. Further, nurse visits where the physician was <i>not</i> seen accounted for 10 percent of the visits to physicians' offices (10).</p>
<p>II. Hospital Utilization. Hospital utilization can be classified according to the volume of services consumed, type of hospital, type of services and type of admission.</p> <p>A. Volume of services: admissions and/or discharges; length of stay; expenditures; occupancy rate.</p> <ol style="list-style-type: none"> <li>1. Admissions and/or discharges: number of hospitalized illness episodes for an individual in a given time period (provides a gross index of an individual's use of services); hospital admission rates per 100 person-years; hospital admission (or discharge) rate per 100 persons per year; hospital admission (or discharge) rates per 1000 persons per year and per 100,000 persons per year; proportion of a population or group admitted to a hospital; hospital discharges per 100 families.</li> <li>2. Length of stay indices yield measures of individuals' total hospital days: total number of hospital days per person per year and mean length of stay per hospital admission (or discharge).</li> </ol> <p>Rates reflecting the length of stay for groups of individuals include patient days per 100 person-years; patient days per 100 persons per year and per 1000 persons per year and per calendar day. Patient days are a product of the number of admissions (or discharges) and mean length of stay per admission (or discharge).</p>	<p>The rate of hospital discharges for the U.S. population increased from 12 per 100 persons in 1962-63 (98) to 12.7 in 1965-66 (112). In 1968, this rate fell to 12.2 per 100 (120) and rose once again to 12.9 in 1969 (122). The rate of approximately 130 admissions per 1000 persons in 1969 contrasts sharply with the rate of only 59 per 1000 in 1935 (18).</p> <p>There is an inverse relationship between admission rate and average length of stay. In 1935, when there were 59 admissions per 1000 population, the average length of stay was 15 to 16 days. Currently, with a rate of 130 per 1000, the average stay is only 9.4 days (18, 120, 122).</p>

INDICES	SELECTED TRENDS
3. Expenditures: expenditures by families or individuals for hospital services reflect both the volume and price of services consumed.	Over the past twenty years an increasing proportion of the personal health care dollar has been spent for hospital care, while the component for physicians' services has remained fairly stable (18).
4. Occupancy rate: These rates include the number of beds occupied per 10,000 population; the ratio of the number of patient days to the number of bed days, for example.	
B. Type of hospital: The type of hospital may be categorized by service (short-stay general, chronic disease, geriatric and mental hospitals); or by type of ownership (proprietary, nonprofit, or government).	Different patterns of use exist for each kind of institution.
C. Type of services: Hospitals provide inpatient, outpatient, emergency room, and ancillary services such as lab, X-ray.	
D. Type of admissions: Hospital admissions are for a variety of reasons under general headings of medical, surgical, and obstetrical care, for example.	Each type of admission makes different demands on hospital resources.
<b>III. Dentist Utilization:</b> Dentist utilization includes measures of the volume of services used, the type of service, and type of dentist specialty.	
<b>A. Volume of services used:</b>	
1. Time interval since last visit: dentist visit within the past twelve months.	In 1930, 21 percent of the population saw the dentist at least once during the year (18). In 1963-64, this proportion climbed to 42 percent (107) and to 54 percent in 1969 (122). The average number of dentist visits per person per year in 1969 was 1.5 visits, a slight increase from 1.3 in 1968 (122).
2. Mean number of dentist visits per person per year gauges the volume of services for individuals.	
3. Aggregate measures of dentist use include the number of persons using services per 100 person-years and the number of dentist visits per family or unrelated individuals per year.	
4. Total expenditures per family (or per individual) for dentist services is another often-used measure of the volume of services consumed.	
B. Type of service: Dentist services are both restorative and preventive. Restorative services include extractions, fillings, crowns, bridges and dentures, while preventive dentistry involves prophylaxes and examinations.	

**Section 2: Indices of Utilization**

<b>INDICES</b>	<b>SELECTED TRENDS</b>
C. Type of dentist specialty: A variety of specialists such as orthodontists, periodontists and dental surgeons provide dentist services.	
IV. Nursing and Personal Care Homes:	An increasing proportion of the personal health care dollar is being spent for these services (18).
The type of services provided by such homes include nursing care only, personal care with nursing, or personal care only.	
As with hospitals, volume of services, including the number of admissions and length of stay, is an important index for describing the use of nursing and personal care facilities.	
V. Drugs and Druggists:	Some few references appear in the literature regarding the actual use of druggists' services.
The number of prescribed and non-prescribed drugs and the expenditures for prescriptions and non-prescribed remedies are useful measures of drug consumption.	The actual dollar expenditures for drugs has increased since 1930, though changes in the consumption of drugs through time are difficult to document.
VI. Appliances:	
Health appliances that are frequently used include corrective lenses, hearing aids, trusses, braces, crutches, artificial limbs, walkers and wheelchairs.	
VII. Other:	
Other health services involve home care, school health programs, and private duty nursing.	
VIII. Indices of Total Utilization:	
Indices of total utilization of all types of health services are useful measures to gauge the total volume of services consumed.	
The mean number of medical contacts per person per year provides a gross measure of individuals' use of services.	
Other indices of individuals' or families' total utilization of health care services and indices of individuals' or families' total expenditures for health care similarly yield useful estimates of total health care consumption.	

### Section 3: CORRELATES OF UTILIZATION

CORRELATES	FINDINGS
1. Predisposing Variables: These include socio-demographic correlates, social-psychological correlates and previous health behaviors.	
A. Socio-demographic correlates: age, sex, education, marital status, family size and composition, race and ethnicity, and religious preference comprise the socio-demographic correlates.	
1. Age: Age is an important predictor of utilization, primarily because of its close association with morbidity.	The relationship between the volume of physician visits and age is best described by a U-shaped curve. Old people and the very young tend to use more services, because the former have a higher prevalence of chronic diseases and the latter a higher prevalence of acute conditions (2, 9, 10, 11, 13, 18, 21, 22, 24, 32, 43, 52, 68, 74, 79, 82, 99, 100, 101, 102, 104, 106, 109, 114, 115, 118, 119, 120, 121, 122, 126, 127, 128, 131, 147, 148, 150, 155, 158, 171, 173, 177, 191, 198, 203, 204).
	Persons 65 years of age and older are more likely to have visits to their homes by physicians than any other age group, though the proportion of home visits for this group, as for the population as a whole, is declining (10, 17, 24, 41, 99, 101, 109, 115, 119, 121, 141, 147, 158, 177, 198, 204).
	Regarding the type of visits to physicians, adults have much higher rates of surgery than children (9, 10, 17, 18, 21, 24). More children under six receive preventive exams than any other age group (2, 9, 10, 18, 23, 50, 55, 82, 95, 101, 102, 158, 171, 174, 192, 198, 202), and the very old and the very young are more likely to visit physicians in response to illness than the middle aged (9, 10, 14, 82). Most telephone consultations are for children under 17 (198). High rates of obstetric visits by women in childbearing years, 15-44, increase the rates of physician use for this age and sex category (10, 18, 21, 40, 138, 139, 147, 202).
	Young children are more likely than any other age group to use specialists (10, 17, 24, 52, 68, 82, 99, 109, 115, 158, 173).
	Hospital admission and/or discharge rates are lower for children than any other age group; the rate is highest in the reproductive years and then declines until ages 65 and over, where it peaks once again (10, 13, 15, 18, 20, 21, 41, 44, 45, 56, 59, 90, 97, 98, 99, 100, 103, 108, 109, 112, 114, 116, 118, 119, 120, 121, 122, 131, 133, 134, 136, 137, 158, 177, 198, 204).

CORRELATES	FINDINGS
1. Age (cont.)	<p>The length of hospital stay increases steadily with age (9, 10, 13, 15, 18, 20, 21, 41, 44, 45, 52, 56, 59, 90, 97, 99, 103, 108, 109, 112, 114, 116, 120, 121, 122, 123, 127, 128, 132, 137, 143, 150, 155, 156, 198, 204).</p> <p>People 65 and older spend more money on hospital services than any other age group (9, 10, 18, 22, 56, 74, 99, 104, 106).</p> <p>In addition to those in geriatric hospitals, patients in chronic disease hospitals are also primarily elderly (123, 132, 133, 134, 135, 136, 137).</p> <p>The U-shaped use curve for physician visits is reversed for dental care, with the youngest and oldest groups least likely to see a dentist (9, 10, 11, 13, 17, 18, 21, 22, 50, 99, 100, 104, 105, 106, 107, 118, 120, 121, 122, 137, 141, 142, 158, 198, 203, 204).</p> <p>Restorative services increase with age among persons under 25 and then level off, while preventive dental visits decrease with age up to 25 (17, 50, 99, 105, 158).</p> <p>Approximately 70 percent of the residents of nursing and personal care homes are 75 years of age or older (17, 123, 126, 127, 128).</p> <p>The consumption of and expenditure for prescribed and nonprescribed drugs increases with age (10, 13, 17, 18, 22, 32, 99, 106, 110, 113, 150, 203, 204).</p> <p>People over 45 use more corrective lenses and other appliances than do the younger age groups (10, 17, 21, 99, 104, 112, 117, 129, 204).</p>
2. Sex : Sex influences the use of health services, primarily due to morbidity patterns, especially women's needs for obstetrical care.	<p>Beginning with the childbearing years, 15-44, and continuing through old age, females consume more physicians' services than males (10, 13, 18, 21, 24, 32, 33, 52, 68, 74, 79, 99, 100, 101, 102, 104, 106, 109, 111, 114, 115, 120, 121, 122, 126, 127, 128, 131, 150, 171, 177, 203, 204).</p> <p>The types of physicians' services sought differ for males and females. Females have more surgery (10, 17, 18, 21, 24) and are more likely to have preventive physical exams. Males' exams are more often required (10, 18, 24, 33, 101, 102, 171, 192) and males more frequently see a physician in response to symptoms than females (10, 14).</p> <p>Females are somewhat more apt to see specialists than males (10, 17, 52, 68, 109, 115).</p>

### Section 3: Correlates of Utilization

CORRELATES	FINDINGS
2. Sex (cont.)	<p>Hospital admission and/or discharge rates are higher for females than males. If obstetrical admissions are excluded, this gap narrows considerably (10, 13, 18, 20, 21, 41, 44, 45, 56, 99, 100, 103, 108, 109, 111, 112, 114, 116, 119, 120, 121, 122, 131, 132, 133, 134, 136, 137, 177, 204).</p> <p>The average length of stay is higher for males than females, but if obstetrical care is not included, the average stay is approximately the same (10, 13, 18, 20, 21, 41, 44, 45, 52, 56, 99, 103, 108, 109, 112, 114, 116, 120, 121, 123, 127, 128, 132, 134, 135, 136, 137, 143, 150, 203, 204).</p> <p>Women's expenditures for hospital services are consistently higher than men's, again primarily due to obstetrical care (10, 18, 56, 74, 99, 104, 106).</p> <p>More women than men are residents in geriatric and chronic disease hospitals, while men outnumber women in mental hospitals (123, 132, 133, 134, 135, 136, 137).</p> <p>Females use more dental services than males (10, 13, 17, 18, 21, 99, 100, 105, 106, 111, 120, 121, 122, 137, 141, 191, 203, 204).</p> <p>More females than males occupy nursing and personal care homes (17, 123, 126, 127, 128).</p> <p>Women consume more drugs and medications (10, 13, 17, 18, 32, 99, 106, 110, 113, 150, 203, 204).</p> <p>A higher proportion of women than men use eye glasses or other special appliances (10, 17, 21, 99, 104, 112, 117, 129, 204).</p>
3. Education: Education is an important determinant of overall use and especially of preventive care-seeking behavior.	<p>The consumption of physician's services increases as educational level increases, primarily due to the greater use of preventive services by better-educated (2, 9, 10, 11, 13, 29, 33, 52, 101, 102, 104, 106, 115, 118, 147, 148, 155, 171, 173, 191, 203).</p> <p>Individuals with more education are more likely to have preventive exams than the less-educated (37, 47, 55, 94, 95, 101, 171, 174, 202).</p> <p>Better-educated women initiate prenatal care earlier and obtain more services than do the less-educated (10, 40, 48, 138, 202).</p>

CORRELATES	FINDINGS
3. Education (cont.)	<p>Hospital admission and/or discharge rates are lower for the lowest education groups (10, 13, 15, 29, 41, 56, 108, 118).</p> <p>The average length of stay is longer for the least-educated (9, 10, 13, 15, 52, 56, 108, 155, 156, 203).</p> <p>The better-educated consume many more dental services, independent of income differences (9, 10, 11, 13, 17, 29, 48, 50, 58, 104, 105, 106, 107, 173, 191, 203).</p> <p>The rate of preventive-service dentist visits is consistently higher for the better-educated (17, 50, 58, 78, 105).</p>
4. Marital status: The marital status variable primarily reflects age, sex, and morbidity patterns.	<p>Marital status is related to the use of physicians' services since married, widowed and separated persons tend to be older, and married women use more obstetrical services (9, 13, 24, 52, 101, 102, 115, 155).</p> <p>Similarly, hospital admissions and/or discharges and lengths of stay reflect the age and sex composition and morbidity status of the various marital status categories (9, 13, 52, 56, 108, 132, 134, 136).</p>
5. Family size and composition.	<p>The effects of family size and composition upon the use of health services are linked with the income, age, and sex variables (9, 11, 13, 24, 43, 52, 79, 99, 103, 106, 116, 118, 131, 146, 155, 203).</p>
6. Race and ethnicity: Race predicts the volume of services consumed and the site of the visit. These relationships are independent of income differences.	<p>Whites consume more physician services than nonwhites (1, 9, 10, 11, 13, 101, 103, 106, 115, 118, 119, 121, 147, 148, 158, 173, 191).</p> <p>More whites than nonwhites consult with physicians in the home, office or by telephone, while more nonwhites see physicians in hospital clinics or emergency rooms (1, 10, 25, 101, 115, 119, 121, 141, 147, 158).</p> <p>Nonwhites are less likely to have preventive checkups (9, 10, 47, 55, 94, 95, 101, 102, 158, 174, 190, 192, 202).</p> <p>Whites make greater use of specialists than nonwhites (10, 115, 158, 173).</p> <p>The rates of hospital discharges and admissions are greater for whites than nonwhites (10, 13, 15, 56, 103, 108, 116, 118, 119, 121, 132, 133, 134, 136, 137, 158).</p> <p>Nonwhites, in general, average longer lengths of stay in hospitals (9, 10, 13, 15, 56, 103, 116, 121, 123, 132, 133, 134, 135, 136, 137).</p>

**Section 3: Correlates of Utilization**

CORRELATES	FINDINGS
6. Race and ethnicity (cont.)	<p>Personal health expenditures for hospital services are greater for whites (9, 10, 56, 106).</p> <p>Fewer than 10 percent of the residents of geriatric and chronic disease hospitals are nonwhite (123, 132, 133, 134, 135, 136, 137).</p> <p>Fewer than five percent of the residents of nursing and personal care homes are nonwhites (123).</p> <p>Nonwhites see dentists much less frequently than whites (9, 10, 11, 13, 105, 106, 107, 118, 121, 141, 158, 173, 191).</p>
7. Religious preference.	No striking or consistent relationship between religious preference and utilization of health services appears in the current empirical literature (25, 36, 40, 55, 174, 207).
B. Social-psychological correlates: These include general health care attitudes, knowledge and sources of health care information, situation-specific stresses, generalized stresses, and the patient-physician interaction.	
1. General health care attitudes	These variables have little utility in predicting the use of health services. Studies examining the relationship between health beliefs and various types of use show little or no association between the two. Medical orientation (9, 17, 30, 37, 55, 57, 66, 79, 86, 87, 88, 93, 95, 147, 148, 149, 151, 174, 181, 188, 195, 203, 207), perceived availability of care (29, 33), tendency to use services of a physician (29, 32, 33), and skepticism of medical care and physicians (2, 9, 29, 93, 149) also show little relationship to use.
2. Knowledge and sources of health care information	The relationship between knowledge and sources of health care information and use of health services may be better accounted for by differences in level of education (9, 17, 23, 34, 36, 37, 42, 48, 61, 149, 174, 181).
3. Situation-specific stresses	Findings regarding these factors are ambiguous. Perceived susceptibility (23, 55, 75, 76, 77, 78, 168, 169, 194), perceived seriousness (7, 29, 36, 75, 76, 77, 78, 157, 168, 169, 194, 199), perceived chance of recovery (23, 26, 75, 76, 77, 168, 169, 194) and psychological readiness (27, 30, 168, 194) are aspects of Rosenstock's social-psychological model of health service utilization. The difficulty in measuring these variables — a major methodological problem — may account for these ambiguities.

CORRELATES	FINDINGS
4. Generalized stresses	The limited number and local nature of studies prevent definitive conclusions regarding the effect of these variables. Generalized stresses include psychological - upsetting events, crises, chronic stresses (3, 5) or fear, worry, anxiety (23, 26, 60, 78, 87, 88, 148), and structural variables - social isolation (26, 92, 93, 94, 95, 149), broken family (201, 205), for example.
5. Patient-physician interaction	This variable may be of some use in describing the decision-making involved in a physician's rendering services to a patient (20, 38, 39, 52).
C. Previous health behavior	Past health behavior influences present health-care seeking, especially for preventive services.  Evidence suggests that people who have sought physician services in the past will continue to do so and mothers' past behavior, especially, influences children's preventive-care seeking (2, 11, 61, 95, 147, 148, 202).
II. Enabling Variables: These include economic correlates, the availability of services, and organizational correlates.	Similar relationships have been demonstrated for the use of dentist services (58, 78, 87, 88).  In general, the higher socio-economic status groups consume more physician services, though evidence that this gap is narrowing appears in the literature (1, 9, 11, 13, 24, 30, 32, 65, 74, 83, 106, 146, 153, 155, 164, 166, 196).  Relatively more middle and upper class individuals consult with physicians in their homes, the physician's office or by telephone, while lower class persons see doctors in hospital clinics and emergency rooms (1, 24, 25, 86, 141, 164, 166, 196, 197).  The lower social classes are more likely to have walk-in visits to see the physician, while the higher status categories more often have regularly-scheduled appointments (86, 141, 149, 164, 166, 197).  The higher social class groupings have a higher frequency of preventive-service visits to physicians (24, 34, 42, 47, 55, 61, 66, 94, 95, 181, 191, 207) especially for children, but both the low and high social classes tend to see physicians at the same rate when illness occurs (9, 14, 157, 164, 196).  Several studies suggest that higher status women seek prenatal care earlier and consume more services (34, 40, 195, 206).

Section 3: Correlates of Utilization

CORRELATES	FINDINGS
2. Income: In general, the relationships found for socio-economic status hold for income.	Lower class people use fewer specialists (24, 83, 206). Higher status groups use more dentist services, especially those of a preventive nature (9, 11, 13, 78, 86, 140, 141, 142, 151, 190).
	In the past, the higher the income, the greater was the volume of physician services consumed. New methods of financing medical care for the poor have caused this gap to narrow, however (2, 9, 10, 11, 13, 18, 21, 22, 29, 30, 33, 52, 82, 85, 96, 99, 101, 102, 104, 106, 109, 115, 118, 119, 121, 150, 158, 171, 185, 191, 198, 203).
	A large number of studies show that people with low incomes more often seek physicians' services in hospital emergency rooms and clinics (10, 25, 41, 85, 86, 93, 99, 101, 109, 115, 119, 121, 158, 198).
	People with the lowest incomes have the lowest rates of surgery (9, 10, 18, 21). High-income groups are more likely to use preventive services, especially children from high-income families (2, 9, 10, 18, 28, 29, 33, 47, 55, 82, 85, 96, 101, 102, 158, 171, 192, 198, 202). Both high- and low-income groups seek physician services for serious illness at similar rates (9, 10, 14, 82, 85, 93, 157).
	High-income persons use more specialist services (10, 52, 82, 85, 96, 99, 109, 115, 158).
	In the past, the lower-income groups generally had lower hospital admission rates than the high-income, but this relationship is being reversed because of the growth of health insurance and financing programs for the poor (10, 13, 15, 18, 21, 29, 41, 44, 49, 56, 86, 96, 97, 99, 103, 108, 109, 116, 118, 119, 121, 185).
	Low-income persons still have longer average lengths of stay than the high-income groups (9, 10, 13, 15, 18, 21, 41, 44, 49, 52, 56, 96, 97, 99, 103, 108, 109, 116, 121, 150, 156, 185, 198, 203).
	The higher the income, the greater are the expenditures for hospital services (9, 10, 18, 22, 56, 99, 104, 106).
	Income is strongly related to dentist use, with high-income persons using more services (9, 10, 11, 13, 18, 21, 22, 23, 29, 48, 58, 86, 87, 88, 99, 104, 105, 106, 107, 118, 121, 158, 185, 191, 198, 203).

CORRELATES	FINDINGS
2. Income (cont.)	<p>High-income individuals seek more preventive services from dentists than do low-income persons (58, 99, 105, 158, 185).</p> <p>Expenditures for prescribed and non-prescribed drugs are greater for high-income persons (10, 13, 18, 22, 99, 106, 110, 150, 203).</p>
3. Price of medical services	<p>When the price of medical services to the consumer is reduced through charity care, insurance or government financing programs, more services will be purchased. Changes in the price of medical services through such programs have contributed to the changing relationship of income to use.</p> <p>Low-income people, especially, tend to use more physician services when the price of such services is reduced (2, 9, 11, 29, 30, 33, 52, 60).</p>
4. Methods of financing	<p>Low-priced or free hospital care similarly encourages more admissions (9, 29, 52, 59, 60, 156, 170).</p> <p>The price and subsequent use of services is influenced by third-party payment mechanisms, the type of coverage provided by such payors and the method of payment required of the consumer, such as fee-for-service or prepayment.</p> <p>Two means through which the price of medical services to consumers can be reduced are voluntary insurance and government programs such as Medicare, Medicaid and welfare.</p> <p>People with voluntary health insurance tend to consume more physician services than those who do not have this coverage (2, 9, 10, 13, 18, 21, 24, 29, 30, 32, 33, 52, 74, 82, 85, 99, 106, 155, 203, 204).</p> <p>Similarly, persons with voluntary hospital insurance are more often admitted to hospitals than those who do not have third-party payment mechanisms. This impact is especially great for the low-income insured, who have much higher admission rates than low-income people without insurance (10, 13, 18, 20, 21, 29, 49, 56, 97, 204).</p> <p>Regardless of income, people with no insurance have longer stays than the insured (9, 10, 13, 18, 20, 21, 46, 49, 52, 54, 97, 99, 143, 144, 155).</p> <p>The rates of hospitalized surgery are larger for the insured population than the uninsured (9, 10, 17, 18, 21, 24).</p>

**Section 3: Correlates of Utilization**

CORRELATES	FINDINGS
	<p>The insured also use more dentist services (9, 10, 13, 17, 18, 21, 29, 49, 106, 203, 204).</p>
	<p>Medicaid, Medicare and welfare programs have reduced the price of medical services to the poor so that they consume more physician (2, 9, 13, 29, 30, 33, 157, 173, 180, 185) and hospital services (8, 9, 13, 29, 125, 185) than the poor who are not a part of such programs.</p>
	<p>The type of coverage provided by third-party payors (for instance, indemnity, Blue Cross-Blue Shield, major medical) also influences the volume of services consumed (46, 74, 81, 82, 90, 143, 144, 155, 200).</p>
	<p>Though there is some evidence that the fee-for-service method of reimbursement produces different patterns of use than the prepayment mechanism, the specific impact of this variable on use has not been separated from other organizational factors (19, 44, 45, 80, 81, 85, 140, 141, 144, 145, 153, 160, 163, 179, 191).</p>
B. Organizational correlates: alternative organizational forms and type of practice.	
1. Alternative organizational forms	<p>A variety of alternative organizational forms for health services delivery exist: prepaid group practices (Columbia Medical Plan, Health Insurance Plan of Greater New York, Kaiser Foundation Health Plan, Ross-Loos Medical Group); prepaid dental plans (Group Health Dental Insurance); solo fee-for-service plans (Group Health Insurance, San Joaquin Foundation); and comprehensive health care programs for populations of low-income enrollees (comprehensive child care programs, Cornell Welfare Project, OEG neighborhood health centers). In addition, Sweden, Canada, and England, for example, have forms of health services delivery that are very different from those in the United States.</p>
	<p>The precise influence of various payment mechanisms (such as prepayment, and fee-for-service) has not been separated from the organizational correlates (solo or group practice, for example) so that it is difficult to define the precise impact of these alternative forms on use.</p>
	<p>In general, however, the availability of comprehensive medical services to an enrolled population permits those who have traditionally received less care, such as low-income families, to use more hospital and physician services — at least initially, and that some organizational forms encourage lower rates of hospital use for enrollees over time.</p>

CORRELATES	FINDINGS
2. Type of practice	<p>There is evidence that enrollees in prepaid group practice plans use fewer hospital services than do non-plan members (19, 44, 45, 80, 81, 144, 145, 153, 179).</p> <p>The one study of a prepaid dental plan indicates that the prepayment mechanism did not significantly encourage members of the lower occupational categories to seek dentist services (140).</p> <p>Members of solo fee-for-service plans have higher hospital admission rates than prepaid group practice plan participants (19, 24, 41, 45, 80, 81, 85, 144, 145).</p>
C. Availability of services: region, residence, distance, supply of medical personnel and facilities, regular source of care.	<p>Comprehensive health care plans for the poor or the enrollment of indigent populations in existing comprehensive health plans have served to increase use of physician and hospital services by low economic status groups — at least initially (4, 62, 63, 68, 141, 173, 180, 187).</p> <p>Health delivery systems in Canada, Sweden, and England, where the financial barriers to use are fewer, demonstrate a weaker relationship of social class to use than found in the U.S. (12, 13, 14, 31, 32, 90, 152, 153). However, this relationship is also changing in the U.S. with the introduction of new financing mechanisms and delivery systems.</p>
1. Region	<p>National data suggest that the volume of physician visits, hospital discharges, length of stay, and dentist visits vary by geographic region.</p> <p>The West has the highest volume of physician visits per person (101, 102, 106, 109, 111, 115, 118, 121).</p> <p>The annual hospital discharge rate is highest for persons residing in the South (103, 108, 109, 111, 116, 118, 121, 131, 133, 137).</p> <p>The average length of stay is lowest in the South (103, 108, 109, 116, 121, 125, 128, 133, 137).</p> <p>Persons living in the Northeast have more dentist visits than any other region, while the South has the lowest rate of dentist use (105, 106, 107, 111, 118, 121).</p>
2. Residence	Farm residents use fewer health care services than metropolitan or rural non-farm residents.

### Section 3: Correlates of Utilization

CORRELATES	FINDINGS
2. Residence (cont.)	<p>The number of physician visits is highest among residents of Standard Metropolitan Statistical Areas (SMSA's) and lowest for persons on farms outside the SMSA's (9, 10, 11, 13, 18, 21, 22, 24, 52, 101, 102, 106, 109, 111, 115, 118, 121, 150, 204).</p> <p>Whereas an estimated 70 percent of the physician visits for the population as a whole take place in physicians' offices, over 80 percent of the farm population visit doctors in their offices (111).</p> <p>Persons in non-farm areas outside metropolitan centers have the highest hospital discharge rates, but the rates for the farm and metropolitan residents are very similar (10, 13, 18, 21, 56, 103, 108, 109, 111, 116, 118, 121, 204).</p> <p>Patients in metropolitan areas have the longest hospital stays and farm residents the shortest (108).</p> <p>Residents of metropolitan areas use the most dentist services and farm people the least (9, 10, 11, 13, 17, 18, 21, 22, 105, 106, 107, 111, 118, 121, 204).</p>
3. Distance	<p>Distance influences the choice of the site for the visit, but not the volume of services consumed (1, 25, 29, 30, 55, 56, 72, 95, 156, 159, 173, 178, 196, 197, 202).</p>
4. Supply of medical personnel and facilities	<p>Hospital admissions increase when the supply of physicians is low or the supply of hospital beds high (9, 15, 29, 49, 54, 56, 150, 161, 162, 176, 204).</p>
5. Regular source of care	<p>Use of physicians' services is greater for those who have a physician as a regular source of care (9, 11, 29, 32, 33, 48, 157, 165, 183).</p>
III. Need Variables:	<p>Need for care is one of the most important predictors of use, especially for the less-discretionary hospital and physician services. A number of correlates discussed earlier (such as age, sex and marital status) are often measures of morbidity. Indices of need include health and mobility status, perceived symptoms of illness, physician-rated urgency, chronic activity limitation status, disability days, diagnosis and surgery. Some are more effective predictors of use than others.</p>
A. Health and mobility status	<p>Individuals with poor health are likely to seek physician and hospital services (9, 11, 13, 55, 59, 79, 80, 147, 148, 150). Mobility status is useful in appraising the needs of residents of institutions for the elderly and chronically ill (126, 127, 128, 129, 131).</p>

CORRELATES	FINDINGS
B. Perceived symptoms of illness	When individuals perceive symptoms to be serious, they are especially likely to seek physicians' services (3, 5, 9, 10, 13, 30, 52, 59, 82, 93, 157).
C. Physician-rated urgency	Examination of physician urgency ratings for hospital emergency room services indicates that many non-urgent conditions are brought to emergency rooms (7, 89, 157, 159, 172, 199).
D. Chronic activity limitation status	Persons with severe chronic activity limitation use more physician services (29, 33, 60, 68, 80, 101, 106, 110, 115, 131, 150, 185, 197), are more likely to be in institutions for the elderly or chronically ill (126, 127, 128, 131), and use more health appliances (129) than individuals without such impairments.
E. Disability days	The more disability days an individual has, the more likely he is to seek physician services (9, 13, 29, 32, 96, 150).
F. Diagnosis	The nature of the diagnosis influences the number of visits to a physician (24, 60, 68, 99, 101, 109, 197), hospital admission and length of stay (8, 20, 45, 56, 71, 90, 99, 108, 109, 132, 133, 134, 135, 136, 137, 170) and the volume of drugs and medications consumed (113).
G. Surgery	Whether or not surgery is sought influences the number of visits to a physician (9, 10, 18, 21, 24, 111), the site of such physician visits (10, 17, 24, 111), the type of services received (4, 9, 10, 17, 18, 21, 24) and the specialty of the attending physician (10, 17, 24).
	The hospital admission rate (4, 10, 18, 20, 21, 45, 56, 108, 111, 132), length of stay (9, 10, 18, 20, 21, 56, 108, 132) and the types of service used within the hospital (9, 17, 20, 56) are affected by the kind of surgery performed.

## Section 4: BIBLIOGRAPHY

1. Abernathy, W. J. and E. L. Schrems, 1971. "Distance and health services: issues of utilization and facility choice for demographic strata." Research Paper No. 19. Stanford University: Graduate School of Business.

This study showed that proximity to a primary care facility influenced a family's choice of that facility. Choice declined steadily as the center's distance from the family increased.

The study surveyed families in widely diverse socio-economic groups in a well-defined agricultural region 100 miles from San Francisco in the San Joaquin Valley.

The families were segmented into statistically homogeneous "use" sub-groups, based upon industry of employment, occupation, education, ethnicity, religion, income, source of medical payment and residency duration. A special census provided this socio-demographic information.

Health facility encounter forms were cross-referenced to the census families and yielded actual utilization of a single facility during the fall months of 1970.

Travel times were measured from the centers of 200 census blocks (outside incorporated city limits) to each separate location in the area where primary health services were available.

In order to identify overall utilization an index was devised which yields, for each family, its deviation from the national average of the percent of family members that visited a physician in the past year:  $U = \frac{n - a}{k}$ . "n" represents the number of family members who saw a physician in the past year; "a" is the national average (for families of the same size, age and sex composition) who visited a physician in the past year; and "k" is the size of the family.

The socio-demographic strata were derived through ALD analysis. Distance as a barrier to utilization was studied through multiple regression analysis to determine the association between travel time and use.

Mexican-Americans and other ethnic groups were least affected by convenient location in their choice behavior. For minority group families, familiarity and social ease are probably dominant factors.

Distance from health care facilities did not influence families' overall utilization of services.

2. Aday, L. A., 1971. "Dimensions of family's social status and their relationships to children's utilization of health services." Unpublished manuscript. Johns Hopkins University: Department of Medical Care and Hospitals.

This study examined the relationship of the relative price of medical services for families, family size, and the mothers' attitudes, education, and health services to whether children under 15 saw a physician or had a physical exam within the past 12 months.

Data analyzed came from a household survey of the Baltimore SMSA conducted from June, 1968 through May, 1969 as part of the World Health Organization International Collaborative Study of Medical Care Utilization. Only data for children under 15 were considered for this analysis.

Whether the child saw a physician in the past 12 months or had a general physical exam during that time provided the measures of use.

An important dimension in this study was the relative price correlate. A net price variable for the poor based upon whether they pay none or some or all of their medical expenses out-of-pocket was computed. The relative price variable was then constructed, integrating this net price and an income variable. The price of services relative to income for those poor who pay none of their medical expenses out-of-pocket begins to approximate that of the high income. The relative price of services, from high to low was then described as follows: (1) poor who pay some or all of their expenses, (2) low income, (3) poor who pay none of their expenses, and (4) high income.

This relative price correlate, the number of siblings in the family, mother's education, her high or low skepticism about medicine and physicians, and whether she saw a physician or had a general physical exam within the past 12 months were examined for each of the indices of use.

The Chi-square test of significance and factorial Chi-square test for interaction were used to analyze the data.

Children in poor families which did not pay medical expenses out-of-pocket (low relative price) used as many or more physicians' services than children in high income families. And children in families in these two relative price categories used more physicians' services than children in the other poor and the low-income families.

Findings related to the other correlates revealed that for children under five, the larger the number of siblings, the less often the child had a physical exam. For children five to nine, the higher the mother's skepticism, the less often the child had an exam. For children age 10-14, the higher the mother's skepticism, the less often the child saw a physician within the year or had an exam. Further, if the mother had an exam, the child more often had an exam.

The study concluded that the relative price variable influenced the child's utilization of physician services, and the mother's attitudes and behaviors were especially relevant for explaining the differential use of preventive services.

3. Alpert, J. J., et al., 1971. "A month of illness and health care among low-income families." *Public Health Rep.* 82 (August): 705-713.

A pattern of association between symptoms, upsetting events, crises, chronic stress conditions and a family's medical-care-seeking emerged in this study, suggesting the family as a useful analytical unit for studying health behavior.

Seventy-eight families from a longitudinal study of 500 low-income families living within three miles of the Children's Hospital Medical Center in Boston were interviewed to accumulate data. The mothers kept family health calendars for four weeks.

Symptoms of illness, upsetting events such as small accidents, crises, and chronic stress conditions were considered in relation to assistance received by family members at home or from a professional. Patient days of hospitalization were also considered.

Cross tabulation of percentages and Chi-square test of significance were used to analyze the data.

The families were classified into three groups: A, B and C. Group C reported ten times as many symptoms and four times as many upsetting events as Group A. Group A seemed free of chronic stress and crises. The overall use of medical services increased from Group A to Group C, but Group C still had the most medically non-attended symptoms.

Low-income families used medical services when symptoms indicated need for attention only 14.3 percent of the time. Gastrointestinal symptoms were most often brought to medical attention. Non-specific headaches and contagious diseases were least often brought to a physician's attention.

Upsetting events elicited enough concern for mothers to seek medical advice only 8 percent of the time. Only those accidents with obvious symptoms led to seeking medical help.

In 75 percent of the cases, a clinic or physician's office was visited. More than 20 percent of all medical contacts resulted in hospital admissions. Telephone calls to physicians were underutilized compared with use by middle class populations.

4. Alpert, J. J., et al., 1968. "Effective use of comprehensive pediatric care." *Amer. J. Dis. Child.* 116 (November): 529-533.

This study demonstrated that fewer hospitalizations, fewer operations, fewer physician visits for illness, and more preventive care resulted when families received comprehensive health care.

Families using the emergency clinic of the Children's Hospital Medical Center, Boston, and living within three miles of the facility were interviewed and kept health diaries collected every six months. Four hundred eighty-nine low-income families who had no regular physician and who were willing to participate in a three-year health survey were divided into experimental and control groups.

Every six months, hospitalization and operation rates per 100 children were computed as were health (preventive) and illness visits to a physician per 100 children. The experimental group of families received continuous comprehensive medical care similar to a private group pediatric practice. The program emphasized personal relationships between the health team and the families with concern for the total social, economic, and psychological needs of the families and children. The control group families continued their usual medical care practices.

Utilization rates were cross-tabulated for the experimental and control groups and a Chi-square test of significance performed on the data.

For the first six months the experimental group had higher hospitalization and operation rates than the control group, but during the rest of the study period the experimental group had lower rates.

Physician health visits by the experimental group rose sharply during the first six months and remained consistently higher than control group visits. The rate of illness visits for the experimental group was consistently lower.

5. Alpert, J. J., et al., 1967. "Medical help and maternal nursing care in the life of low-income families." *Pediatrics* 39 (May): 749-755.

This study showed that the mother is the primary agent in the family for defining and organizing responses to children's symptoms of illness.

Health calendars kept by 78 families in a longitudinal utilization study of 500 low-income families living within three miles of Children's Hospital Medical Center, Boston, were collected.

The study analyzed the type of action taken and the type of medical help sought by children's symptoms of illness or upsetting events such as accidents. Types of action taken included no action, emotional response, maternal help at home, or seeking medical help. Types of medical help were telephone calls, office or clinic visits, or hospital admissions.

Simple cross-tabulation of percentages was employed to analyze the data.

A somewhat higher proportion of children's symptoms than adults' symptoms resulted in no action taken, and a somewhat lower proportion of children than adults received medical help for symptoms. Upsetting events more often than symptoms produced no

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action, and when action occurred, multiple office or clinic visits were the most frequent type of medical service sought.

The mother was the one most likely to take action in response to symptoms. Unspecified headaches and contagious diseases were those symptoms most often managed by the mother without outside medical help. Once a decision as to what symptoms should be brought to a physician's attention was made (which was generally done by the mother), it was she who arranged the telephone call, took the child to the doctor's office or clinic, or accompanied the child to the hospital.

See also reference number 3.

6. Alpert, J. J., et al., 1969. "Types of families that use an emergency clinic." *Med. Care* 7 (January-February): 55-61.

In this study stable or unstable relationships with a physician or hospital were cross-tabulated with the participants' income, ethnicity and the presence or absence of hospital insurance to develop a typology for identifying families that use emergency clinic services.

Interviews with participants in the Emergency Clinic of Children's Hospital Medical Center, Boston, were conducted during a six-month period in 1964.

Families who had stable relationships with physicians were those who had established relationships with particular physicians and indicated that they came to the emergency clinic because they were referred or could not contact their physicians.

Families with unstable relationships with physicians were those who, though they claimed to have physicians they usually consulted, came to the clinic without consulting them for such reasons as "people recommended it," "previous visits," "the clinic is the best place" or "the hospital is my doctor."

Families defined as having stable relationships with the hospital did not have established relationships with physicians and came to the clinic because "the clinic is the best place" or "the hospital is my doctor."

The last group, who had unstable relationships with the hospital, had no usual physician and came to the clinic because of previous visits or because people recommended the clinic, or because they couldn't reach a physician, among other reasons.

Simple cross-tabulation of percentage distributions was used to analyze the data.

The four types of families had very different background characteristics. Disadvantaged families, that is, those on welfare or low income, Negro or with Spanish

surnames and who did not have insurance were most likely to be in the unstable-hospital group. The stable-M.D. group had the smaller percentage of disadvantaged families.

7. Ambuel, J. P., et al., 1964. "Urgency as a factor in clinic attendance." *Amer. J. Dis. Child.* 4 (October): 394-398.

This study demonstrated that patients returned for follow-up appointments at a higher rate when the doctor stressed the urgency of the return appointment.

Medical records of a sample of patients in the clinics of Columbus Children's Hospital, Columbus, Ohio, were examined for the rate of broken appointments and a physician urgency rating for the return visits determined.

The data were analyzed by a Chi-square test of significance.

Urgency, as determined by the physician, was found to positively influence the return rate.

8. Ament, R. P., 1967. "Medicare boosts bed usage by elderly." *Mod. Hosp.* 108 (February):81-82.

This study showed that Medicare contributed to a 19 percent increase in the number of days patients 65 years and older spent in hospitals from the third quarter of 1965 to the third quarter of 1966, the first three months of Medicare.

Discharge records of 100 PAS hospitals yielded a sample of one million discharges.

The total stay of all patients discharged in that period divided by the number of calendar days in the period provided the patient days per calendar day. This average, the diagnostic categories of the users and the percentage of change in the length of hospital stay were examined for patients 65 years or older during the first three months of Medicare.

Percentage distributions were portrayed in charts and graphs.

The combined effect of a 14 percent increase in the number of patients 65 and older admitted and a five percent rise in their average hospital stay provided the 19 percent figure.

The distribution of diagnostic categories did not change much except for the eye and ear group (due mostly to the increase in cataract patients), inguinal hernia, and prostatectomy.

9. Andersen, R., 1968. *A Behavioral Model of Families' Use of Health Services*. Research Series No. 25, Center for Health Administration Studies. Chicago: University of Chicago Press.

A model of predisposing, enabling and need factors was introduced to explain families' use of health services. The relative importance of each component in families' use of hospital, physician, and dentist services was analyzed.

The model was based on data gathered through household interviews by the Health Information Foundation and NORC in 1964.

Indices of utilization were hospital, physician, and dentist use and total family use. For hospital use, the basic unit was the hospital day. The total number of days spent in a hospital during 1963 were cross-classified by type of accommodation (Private, semiprivate or ward) and type of admission (surgical, medical or obstetrical). Each type of day was weighted by appropriate hospital daily service charges to arrive at the units of use.

The basic units of physician use were physician visits and in-hospital surgical procedures, weighted by the California Relative Value Scale. Actual dollar expenditures defined dentist use. Total family use was a summation of dollar equivalents of family use for hospital and physician services and actual family expenditures for dental and other care and drugs.

The predisposing, enabling and need factors were examined for each of the utilization indices.

Predisposing correlates included family composition, health beliefs and social structure. Family composition meant family size; the sex, marital status and age of the head of the family; and the ages of oldest and youngest family members. Health beliefs included the value attached to health services, physician, good health and health insurance, attitude toward health services and physician use; and knowledge of disease. Social structure considered the employment, social class and occupation of the main family earner; the education of the family head; ethnicity and race.

Enabling correlates were family and community resources. Family resources included income, savings, health insurance, regular source of care and welfare care. Community resources were physician-population and hospital bed-population ratios, residence and region.

Illness and the response to it constituted need. Illness included symptoms, disability days, health level and free care for major illness. Response included seeing a doctor for symptoms and having a regular physical exam.

The data were analyzed using tau and phi correlations and AID analysis.

The need component was most closely associated with the families' total use of services with the number of disability days being the best single predictor.

The predisposing component followed need in magnitude of correlation with total use. Family size was the

best single predictor for this component. Social structure and health beliefs tended to show less relationship.

Relative to the enabling component, income was the family resource best able to account for differences in use. Community resource availability showed no relationship to use.

In considering the different types of use, need was the primary determinant of hospital use. Physician use was influenced by need, but predisposing and enabling factors were also important. Predisposing and enabling factors were most important for dentist use. In general, predisposing and enabling factors were most useful in explaining differences in use of discretionary services.

10. Andersen, R. and O. W. Anderson, 1967. *A Decade of Health Services*. Chicago: University of Chicago Press.

This study described health care utilization and patterns of expenditures for the decade 1953-1963.

Interviews during national surveys in 1953 and 1958 financed by HIF and in 1963 by HIF and a grant from the Public Health Service provided the data.

The authors examined the percent of persons with one or more hospitalized illness episodes, the source of regular medical care, reasons for seeing the physician, use patterns according to type of service, and expenditures.

Regular source of care included GP, specialists, clinic osteopathy, other or no regular source.

People saw physicians for physical exams or in response to symptoms of illness. The length of time since the last exam and the reason for it (preventive, symptom, or required) was obtained.

Types of service included physician visits, hospitalized surgery, hospital use, obstetrical care, dentists, and eye care.

The percent of persons seeing a physician during a survey year was tabulated as were the mean number of physician visits per person-year, the site of the visit, and the percent of visits to a physician's office when only the nurse attended the patient.

In-hospital surgical procedures per 100 person-years, and the specialty of the physician performing surgery were reported. Hospital use included admissions per 100 person-years, the mean length of stay per admission, and hospital days per 100 person-years.

Obstetrical care involved the month of initiation of prenatal care, the median number of prenatal physician visits and the median number of days for delivery admissions for live births.

Dentist and eye care considered the percent receiving care in each category.

Mean expenditures were tabulated for the types of service — physician, hospital, drug, dentist, and all other

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services. Physician expenditures were for in-hospital or non-hospitalized surgery, obstetrics, and ophthalmology. The site (home, office or hospital) was also considered, as were mean expenditures for prescribed and non-prescribed drugs.

The use variables were examined for the following correlates: sex, age, family income, race, residence, symptoms, education, and insurance coverage.

The findings based on the 1963 survey show a clear increase in most categories of use and in all expenditures.

People with hospitalized or non-hospitalized illness accounted for a small proportion of the population, but consumed a large amount of the health care dollar. Those with non-hospitalized illness included more females and fewer males than the female-male ratio in the total population. Those with illness were more likely to be 55 or over. The illness episode groups contained a slightly smaller proportion of children from low-income families than did the total child population, while the proportion of children from families with income above \$7000 among those with illness episodes was higher than in the total population.

Race was related: non-whites comprised 15 percent of the total sample, but only nine percent of those with hospitalized illness and 12 percent of those with non-hospitalized illness were non-white. There were no large differences by place of residence.

A source of regular care was indicated by 87 percent of the sample. Four out of ten named a GP as the regular source. Females were slightly more likely to have a specialist than males. Of all the age groups, young children more often had specialists and least often had no regular source of care. Low-income families most often had no regular source of care or made use of clinics. Non-whites report less use of specialists and more use of clinics than whites.

Over one-half of the population reported having a physical exam or check-up within one year. One-third reported the time as six months or less. Only 10 percent never had a physical. Differences by sex are minor: females were slightly more likely to have had an exam, largely due to two age groups - 18-34 and 65 and over. Young children 1-5 years of age were more likely to have had a recent exam than people in any other age group.

The higher the income, the greater was the likelihood of having an exam. The percentage of non-whites who reported never having an exam was almost twice as high as the percentage of whites. Persons using specialists as their regular source of care were more likely, and persons with no regular source of care were least likely, to have had an exam within a year.

As reasons for their last physical exam, 39 percent reported symptoms, 32 percent said the exam was required, and 29 percent of the exams were preventive. Men more often reported required exams and women more often had an exam as a preventive measure or in response to illness. Children 1-5 more often had preventive exams. Low-income persons were more likely to have an exam in response to illness and high-income persons as a preventive measure. Whites had more preventive exams.

The two symptoms for which people were most likely to see a physician were acute conditions involving infections and irritations. Response to symptoms varied with age and sex. Females were more likely to see a physician in response to symptoms than males and the very young and very old more than the middle age categories. High-income groups were more likely to respond to symptoms than low-income groups.

The mean number of outpatient physician visits was 4.4 in 1958 and 4.6 in 1963. Children under six were most likely to see a physician at least once a year and children 6-17 least likely. Persons 65 and over had a much higher mean number of visits per year than any other age group. Females were more likely to see a doctor and had a higher mean number of visits than males. Children in low-income families were less likely to see a physician than children in high-income families.

There was a shift from home to office visits from 1958 to 1963 even for those 65 and over who have traditionally made higher use of home visits.

In 10 percent of the physician office visits, only a nurse saw the patient. This distribution varied by sex and age of the patient.

Hospital admissions for surgery accounted for 35 percent of all admissions to short term hospitals in 1963, a slight decline from 38 percent in 1953, and 36 percent in 1958. Female surgical admission rates exceeded those of males. Children had lower rates than adults. A curvilinear relationship existed for income, with the middle income groups having higher surgical admission rates than low and high income groups. The rate for rural farm people was lower than for others. A greater proportion of surgical procedures was performed by board certified specialists.

The hospital admission rate of 13 per 100 person-years for 1963 was a slight increase over the rate of 12 in 1953. The mean length of stay was 7.4 days for both studies. The total number of hospital days per 100 person-years increased from 87 to 96 in 1963. Hospital admission rates and length of stay were lower for children than for any other age group. The admission rate was highest in the reproductive years (18-34) and then dropped until the 65 and older group.

Length of stay showed a consistent increase with age. The general admission rate was higher for females than for males. The mean length of stay was longer for males than females, but because of higher female admission rates, females used more hospital days per 100 person-years. When obstetrical admissions were excluded, admissions and total hospital days were still about ten percent higher for females, but the length of stay showed little difference.

A bimodal distribution of admission rates by income level was in evidence, with higher rates for the lowest and upper middle income groups and lower rates for the lower middle and upper income groups. These variations were also a function of age and sex composition. Urban residents in the largest SMSAs and rural farm residents had lower admission rates than other residents. Insurance coverage may have been a factor here.

The proportion of women having live births in hospitals and receiving care early in pregnancy increased from 1958 to 1963, and the number of prenatal physician visits increased. Although women from upper income and educational levels saw a doctor earlier in pregnancy, the differences between this and other income and education levels became less pronounced between 1958 and 1963. Income and education were also related to the number of prenatal visits. The median number of days for a delivery admission declined from 1958.

The proportion seeing a dentist increased gradually over the decade and the proportion receiving eye care increased rapidly. The very youngest and the very oldest were least likely to see a dentist. Females were more likely to see a dentist than males. People 55 to 64 were most likely to have eye care, with females more likely than males. High income groups received the most dental care.

Total mean family expenditures for all health services rose from \$207 in 1953 to \$370 in 1963. Family expenditures were higher in urban areas and rose with family income. Physician and hospital services accounted for the highest proportion of expenditures for those families who spent \$200 or more for a particular service.

The mean expenditure per individual for all personal health services rose from \$66 in 1953 to \$172 in 1963. Expenditures were higher for females than for males and increased with age. People 65 and over spent more than any other age group on every type of service except dental care in 1963, and females spent more than males for every service. The greatest percentage increases in expenditures were for hospital services and drugs.

Price increases appear to have contributed about twice as much as increases in use to overall health expenditures. Most of the expenditure increase for

physician services can be accounted for by price increases while most of the drug increase was due to use increases.

Hospitalized surgical procedure rates and hospital admission rates were higher for the insured than for the non-insured. Apart from the influence of age and income, a strong relationship remained between having hospital insurance and use of dental services. Insured people spent about twice as much on health services as the uninsured.

11. Andersen, R. and L. Benham, 1970. "Factors affecting the relationship between family income and medical care consumption." In H. E. Klarman (ed.), *Empirical Studies in Health Economics*. Baltimore: The Johns Hopkins Press.

This study assessed the importance of some factors which may influence the relationship between family medical care consumption and family income.

Interviews obtained during a national survey conducted in 1964 by the Center for Health Administration Studies (CHAS) and NORC with the family as the unit of analysis provided the data.

Physician and dentist expenditures and physician use were examined for family income, illness level, price, quality, preventive care and demographic characteristics. Illness levels were identified as good, fair or poor. Price was the premium cost of all health insurance paid directly by the family. Quality compared a series of regular source of care variables with families reporting a specialist as a regular source of care. Preventive care meant a general exam within the year. Demographic characteristics included the age of the family head, family size, the number of wage earners, education, occupational prestige, race and residence.

Regression analysis was employed to analyze the data.

Income elasticities of observed income for both physician and dental expenditures were heavily influenced by price, quality, demographic characteristics, and preventive care. The price component, more than any other, influenced the relationship of observed income to physician expenditures. Quality and demographic characteristics also confounded the relationship, but preventive care-seeking had little effect. The relationship of dental expenditures to income was primarily affected by demographic characteristics (education, race, residence, etc.).

The strength of the relationship of income and dentist expenditures was greater for permanent income than for observed income. The relationship of these respective income measures to physician expenditures was not as clear-cut.

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The relationship of permanent income to physician expenditures, which was not statistically significant when illness was excluded from the relationship, increased and became significant when illness was introduced. This suggested that families with lower permanent incomes had more illness but spent less per illness episode than those with higher permanent incomes.

The relationship of income to physician expenditures was stronger than that of the relationship of income to physician use measures, suggesting that expenditures underestimated the proportion of services consumed by low-income families.

In summary, the relationship between family medical care expenditures and income must be interpreted with an eye to the other factors that influence this relationship.

12. Andersen, R. and J. T. Hull, 1969. "Hospital utilization and cost trends in Canada and the United States." *Med. Care* 7 (November-December): 4-22.

This study compared hospital costs and utilization experiences of the United States and Canada.

An analysis of statistics from the U. S. Census, the Canada Yearbook and other sources from 1950-1967 provided the data.

Utilization indices (expenditures, discharge rates per 1000 population, length of stay) were analyzed for both countries. The United States system, where independent insurers do not exercise control over hospital costs, was compared to Canada's budget review system in which detailed budgets are prepared and centrally reviewed.

The method of data analysis was cross-tabulation of percentage distributions.

Hospital use and hospital expenditures showed an increase over the entire period reviewed. Increase in use is due to increased population growth and increased use per person. Increased expenditures reflected both use increases and increased price per unit of service due to inflation and genuine increases in costs of services.

Examination of trends in the two nations suggest that increases in hospital expenditures were largely a function of increase in price per unit of hospital service in both systems.

Findings do not suggest that the budget review process in Canada has had an appreciable effect on slowing down price increases there.

The admission rates and length of stay were consistently higher in Canadian hospitals.

While Canada spent more of its GNP for hospital services, the United States spent more for all medical services, especially drugs and dental services. This seems to indicate a different mix of services, with Canada

stressing hospital care and the United States stressing physician services.

13. Andersen, R., et al., 1970. *Medical care use in Sweden and the United States - A comparative analysis of systems and behavior*. Research Series No. 27. Center for Health Administration Studies, Chicago: University of Chicago Press.

This study compared health behavior under two national medical care systems.

The data were collected by interviewing a representative sample of the total registered population of Sweden and a multi-stage area probability sample in the United States in 1963.

Physician, hospital, drug and dentist use were examined.

Physician use included that proportion of the population who saw a physician at least once and the mean number of physician visits per person who saw a physician.

Hospital use was that proportion of the population with hospital care during the year, the mean number of hospital days per person with at least one spell of hospital care, and the mean number of out-patient visits per person with at least one spell of hospital care.

Drug and dentist use were the percent who used prescribed drugs and the percent who saw a dentist during the year.

Predisposing, enabling and need components were analyzed for the different categories of use. Demographic (age, sex, marital status) and social structure (family size, education, social class, farm or non-farm, race) variables constituted the predisposing component.

Family (income, health insurance) and community (region, residence) resources comprised the enabling component.

Perceived illness (symptoms, level of health) constituted the need component.

The findings were based on cross-tabulation of percentage distributions, partial correlations and AID analysis.

The relative effect of the different predictors of use are summarized by the author in the tables that appear on the following page.

Distinct system differences emerged when each of the utilization measures were examined by country with all of the other predictors controlled. The proportions seeing a doctor each year were similar in both countries, but the average of the mean number of physician visits was higher in the United States.

There appeared to be little difference in the proportions of those entering a hospital during the survey year, but the number of days spent in the hospital in Sweden was considerably higher.

The proportions for drug and dentist use were considerably higher for Sweden.

The authors concluded that genuine system differences in health services utilization between the United States and Sweden exist that cannot be accounted for by the individual characteristics of persons in the two countries.

TYPE OF UTILIZATION	TYPE OF PREDICTOR	
	Predisposing	
	Demographic	Social Structure
Physician Physician care	(a 1) Supported for age	(b 1) Supported for social class and race
Number of visits	(a 1) Not supported for age and sex	
Hospital Hospital care		
Number of days	(a 1) Supported for age	(b 1) Supported for race
Prescribed drugs		
Dental care	(a 2) Not supported for age	(b 1) Supported for education

TYPE OF UTILIZATION	TYPE OF PREDICTOR		
	Enabling		Perceived Illness
	Family	Community	
Physician Physician care	(c 1) Supported	(d 1) Supported for region	(e 1) Supported
Number of visits		(d 2) Supported for residence	
Hospital Hospital care	(c 1) Supported for insurance		(e 1) Supported
Number of days		(d 1) Supported for region	(e 1) Supported
Prescribed drugs			(e 1) Supported
Dental care	(c 2) Not supported		(e 2) Supported

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14. Andersen, R., et al., 1968. "Perceptions of and response to symptoms of illness in Sweden and the United States." *Med. Care* 6 (January-February): 18-30.

This study assessed the differential problems of physician use in Sweden and the United States.

Household interviews provided the data on national samples of the Swedish and United States populations.

The percentage of those with symptoms who saw a doctor at least once in the survey year was analyzed by demographic characteristics (age, sex, marital status) and socio-economic characteristics (family income, education, occupation of household head, place of residence).

The data were examined using cross-tabulation of percentage distributions and AID.

In both countries, class and income were more important in determining whether a person consulted a doctor for symptoms than age and sex. Class and income variables influenced response patterns more strongly in the United States than in Sweden.

The authors suggest that the more homogeneous population and a health care system with fewer economic barriers minimize the effects of class differences in Sweden.

15. Anderson, J. G., 1972. "Demographic factors affecting health services utilization: a causal model." Unpublished manuscript. Purdue University: Department of Sociology. (To be published in *Medical Care*).

The author proposed a demographic model for predicting the utilization of hospital services.

Demographic information from the 1960 U.S. Census, Bureau of Business Research statistics for each of the 32 counties in New Mexico, and the August 1, 1969 *Guide Issue of Hospitals* provided the data for this study.

The utilization indices examined were patient-days per 1000 population, hospital admission rates, and average length of stay.

The hospital bed-population ratio, percent unemployment, median education, median age, net migration, and the percent non-white, Spanish-American, urban, and percent agricultural were the correlates tabulated here.

Multiple regression and path analysis were used to analyze the data.

Hospital bed supply is a major determinant of utilization. The author explained that in those areas where alternative health services were lacking or inadequate, an increase in bed supply significantly increased both admission rates and lengths of stay.

Age had about as large an effect on hospital use as did supply of beds. Increased age increased admission rate and length of stay.

Both admission rate and length of stay increased as urbanization occurred in a county, primarily due to the increased availability of hospital services to urban populations. This suggests that in-patient hospital care is substituted for ambulatory care in areas, such as New Mexico, where the physician supply is low (about 80 doctors per 100,000 population).

Socio-demographic factors such as income, unemployment, education, migration, or ethnicity, had little effect on the use of services, probably due to the impact of financing mechanisms such as insurance and Medicaid.

16. Anderson, J. G., 1971. "Sociocultural variations in response to illness: a comparative study of Anglo-Americans and Spanish Americans." Unpublished manuscript. Purdue University: Department of Sociology.

This study assessed the different utilization patterns and responses to illness among Anglo-Americans and Spanish Americans.

Interviews of heads of 270 families in a quota sample of families in Hatch Valley, Dona Ana County, New Mexico were examined. These interviews, the administration of the Cornell Medical Index and medical multiphasic screening of the families yielded the data for this study.

For utilization indices, the author examined self-treatment for illness (including folk remedies such as topical applications, massage, cupping, diet, purgatives and patent medicines), medical assistance outside the family (midwife, friend, M.D., D.O., pharmacist, chiropractor, or *curandera*, a kind of folk doctor), and the attendant at birth (hospital personnel, midwives, members of the family, M.D.s or D.O.s).

Utilization was examined for the different ethnic groups, either Spanish American or Anglo-American.

Cross-tabulation of percentages was used to analyze the data.

The author found that self-treatment among Anglo-Americans appeared to be as great as among Spanish Americans, but Spanish Americans did overwhelmingly seek the services of a physician when illness persisted. A large number of Spanish American families resorted to a midwife for childbirth, however; 25 percent of children under 15 years of age in the families surveyed were not born in a hospital.

17. Anderson, O. W., 1963. "The utilization of health services." In Freeman, H. E., *et al.* (eds.), *Handbook of Medical Sociology*. Englewood Cliffs: Prentice-Hall.

This chapter in the *Handbook of Medical Sociology* (1963) introduces O. W. Anderson's classification of the utilization variable and summarizes indices regarding utilization from the national surveys (1953, 1958) and other studies.

Anderson's typology of use is as follows:

A. General Hospital Services

1. Days
  - (a) Number of days per stay
  - (b) Number of admissions
2. Type of case
  - (a) Medical
  - (b) Surgical
  - (c) Obstetrical
3. Type of accommodation
  - (a) Private
  - (b) Semiprivate
  - (c) Ward
4. Ancillary services
  - (a) Operating room
  - (b) Delivery room
  - (c) Drugs and medications
  - (d) Laboratory
  - (e) Radiology

B. Physicians' Services

1. Site of service — home, office, hospital, clinic
2. Type of service
  - (a) Surgical
  - (b) Medical
  - (c) Obstetrical
3. Specialization
  - (a) General practice
  - (b) Range of specialties
4. Type of practice
  - (a) Solo
  - (b) Partnership
  - (c) Various types of groups

C. Drugs and Medications

1. Number of prescriptions
2. Prescription and nonprescription drugs

D. Dentists' Services

1. Number of visits to dentist
2. General practice and various specialties
3. Types of services
  - (a) Extractions
  - (b) Fillings
  - (c) Crowns, bridges, dentures
  - (d) Prophylaxis

E. Nursing Home Services

1. Number of days per stay
2. Number of admissions

F. Other

1. Appliances — glasses, hearing aids, trusses
2. Private duty nursing

The relationship of socio-demographic characteristics (age, sex, income, residence, education) and social-psychological characteristics (perception of health and health services, general life values, priorities for spending, and knowledge of diseases) to use were explored, as were the methods of financing and the organization of medical care.

According to the 1953 nationwide survey, summarized here, hospital admission rates increased. Females and those in the older age categories had higher rates than males and children. Admission rates for the different income categories became more uniform. Urban utilization was lower than rural. Families with hospital insurance had higher admission rates than those without coverage.

Though in general in western countries hospital admissions have increased, the average length of stay has decreased over time.

Americans' use of physician services increased. A U-shaped curve exists for the relationship of age to use of physician services. This reflects the high rate of acute disease episodes for children and of chronic disease for upper age groups. Females used more physician services, excluding conditions associated with childbirth. The higher the income, the greater was the use of physician services, though this difference has narrowed.

Utilization of dentist services was low. More women than men used dental services but there was a drop-off in use for all persons 65 and over. More high-income than low-income people used dental services, but even for those in the high-income groups, 44 percent did not consult a dentist at least once during the year (1953).

The author concluded that though some relatively consistent trends may be noted for the various socio-demographic correlates of health service utilization, increasing attention must be directed to financing mechanisms, the organizational contexts of care and the effects of the rather vaguely-defined social-psychological variables upon use.

18. Anderson, O. W. and R. Andersen, 1972. "Patterns of use of health services." In Freeman, H., *et al.* (eds.), *Handbook of Medical Sociology*, Englewood Cliffs, N.J.: Prentice-Hall.

This new chapter on utilization in the *Handbook of Medical Sociology* re-introduces O. W. Anderson's typology of use and updates the major national trends.

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The 1963 national survey, summarized in *A Decade of Health Services*, was the major data source for this overview. Data from the two previous national surveys (1953, 1958) were also used. The Anderson typology of use, described in reference number 17, was re-introduced here.

Correlates of use examined were age, sex, residence, income and insurance status.

The authors found that hospital admission rates increased. The relationship to age is U-shaped, with older children receiving the least hospital care. Females have higher admission rates than males. Income appears to be independent of admission rates. People in cities had the lowest admission rates and people in rural non-farm areas, the highest rates. Those with insurance had higher admission rates, including low-income with insurance. The higher the number of admissions, the shorter the average length of stay.

Relative to physician use, physician visits, too, have increased. As with hospital use, the relationship to age is U-shaped because of acute conditions for the young and chronic conditions for the old. Females have a higher mean number of visits per person-year. The disparity between income and mean number of visits has disappeared somewhat, though when use is defined as the proportion seeing a physician, this difference is still salient, especially for children. The upper income groups were likely to seek a larger body of preventive services for children. People with the lowest incomes have the lowest surgery rate.

The use of dental services has been low relative to unmet need, though the proportion seeing a dentist increased from 21 percent in 1930 to 38 percent in 1963. The familiar U-shaped curve for age is reversed here, with children 6-17 receiving most care, and those over 65 much less care. Females used more services than males. The high-income used many more dental services than the low-income.

The discretionary use of preventive services was most common for young children under 5 years of age, females, persons with high incomes and whites. The proportion of expectant mothers seeing a physician by the end of their first trimester and the median number of prenatal visits was greater for high-income than for low-income.

An increasing proportion of the health care dollar has been directed to hospital and nursing-home care and a decreasing proportion to dentists and drugs.

In summary, the authors point out the necessity of a systems approach to understand the complex patterning of health services utilization.

19. Anderson, O. W. and P. B. Sheatsley, 1959. *Comprehensive Medical Insurance: A Study of Costs, Use, and Attitudes under Two Plans*. Research Series No. 9. Center for Health Administration Studies. Chicago: University of Chicago Press.

This study of two health insurance plans compared the cost experience, use and attitudes of members of the plans in 1957.

Interviews from 450 members of GHI (fee-for-service) and 450 members of HIP (prepaid group practice) plans provided the data.

The utilization indices were hospital, physician and other services use. Hospital use included hospital admissions per 100 persons, the number of days per 100 persons, the mean length of stay per admission, and hospitalized and non-hospitalized surgical procedures per 100 persons.

Physician use included the total number of non-surgical, non-obstetrical doctor visits per person per year, and the percent who did not see a physician within the year.

The percent who received dental and eye care or who visited other medical persons comprised the "other services" category.

These use variables were examined for memberships of both the GHI and HIP plans.

The data were analyzed by cross-tabulation of percentage distributions.

GHI enrollees used more hospital services and surgery (both in and outside hospitals) than did HIP enrollees. GHI enrollees had 11 admissions and 87 days of hospitalization per 100 persons in a year, compared with 6.3 admissions and 41 days per 100 for HIP. GHI had 7.6 surgical procedures in the hospital per 100, while HIP had 4.3.

GHI and HIP enrollees used physician services to the same extent except for surgery. GHI had 6 doctor visits a year (exclusive of surgery and obstetrics), compared to 5.5 for HIP. Twenty-six percent of GHI enrollees and 25 percent of HIP enrollees saw no doctor at all during the year.

20. Anderson, O. W. and P. B. Sheatsley, 1967. *Hospital Use - A Survey of Patient and Physician Decisions*. Research Series No. 24, Center for Health Administration Studies. Chicago: University of Chicago Press.

The utilization patterns of particular hospitals and the patterns of physician decision-making regarding admission were described in this study.

Hospital records from a random sample of discharged patients from 50 of the 140 general and short-stay hospitals in Massachusetts from June 1, 1960-May 31, 1961 provided the data.

The utilization indices were the number of admissions, the mean length of stay, the type of admission (surgical, medical, obstetrical), the type of accommodation (private, semi-private, ward) and the length of time which elapsed between the first signs of illness and the time when the doctor was seen.

The correlates examined include age, sex, day of week admitted, diagnoses, the patient's and physician's view of the situation, and health insurance.

The traditional relationships of age, sex and diagnosis to use are summarized. Further, a description of the patient-physician decision-making process involved in seeking and rendering services is provided. This article is especially relevant for persons concerned with the derived demand for services, and the utilization review process in hospitals.

21. Anderson, O. W., et al., 1963. *Changes in Family Medical Care Expenditures and Voluntary Health Insurance*. Cambridge: Harvard University Press.

This study appraised developments and the then-current problems in costs of medical care and family spending for services.

A nationwide survey conducted in 1958 by HIF and NORC provided the data through household interviews. Data from a 1953 HIF national study was also used for comparison with the 1958 data.

Hospital care, surgery, physician visits, and maternity, dental and eye care were studied.

To measure hospital care, the study tabulated admission rates per 100 persons per year, the number of hospital days per 100 person-years and the average length of stay per admission.

Surgery included surgical procedure rates per 100 person-years and in-hospital surgical procedure rates per 100 persons per year.

Physician visits included the percent who received care from a physician and the mean number of out-of-hospital physician visits per person-year.

Maternity care considered the month of initiation and the number of prenatal visits.

Dental and eye care were gauged by the percent receiving care in those categories.

These different types of use were examined for different age, sex, income, residence and insurance categories.

The data were analyzed by a cross-tabulation of percentage distributions.

Only the data specifically relevant to utilization and its correlates are summarized here.

There were no overall changes in hospital admission rates between 1952-53 and 1957-58, but the average length of stay was a little longer in 1957-58. The gap between the insured and the uninsured narrowed. Measured by the number of hospital days per 100 person-years, there was greater use of hospitals in 1957-58. More low-income than high-income persons used hospitals, probably because of the concentration of the elderly in the low-income groupings.

The overall surgical rate in 1957-58 declined from 1952-53. Seventy-six percent of surgical procedures were performed in the hospital and there appears to be little difference by income groupings for the amount of surgical services sought.

In 1957-58, 66 percent of the population saw a physician at least once. The highest percent was for females, 18-34, and the lowest percent for males, 18-54. The average number of out-of-hospital visits was 4.4; 80 percent of these were office visits.

Compared with women who bore children in 1952-53, women with live births in 1957-58 tended to see a physician earlier in pregnancy and more often.

There was some small increase in the percentage who had dental care from 1952-53.

Thirteen percent of the population surveyed saw an ophthalmologist, optometrist, or optician for eye care.

For a summary of utilization patterns in the 1953 nationwide survey see Anderson and Feldman, *Family Medical Costs and Voluntary Health Insurance: A Nationwide Survey*. New York: McGraw-Hill, 1956.

22. Anderson, O. W., et al., 1960. *Family Expenditure Patterns for Personal Health Services - 1953 and 1958: Nationwide Surveys*. Research Series No. 14, Center for Health Administration Studies. Chicago: University of Chicago Press.

This study describes the nationwide pattern for family medical care expenditures in 1953 and 1958.

Household interviews from nationwide surveys in 1953 and 1958 by HIF and NORC provided the data.

The utilization indices were mean gross expenditures per family (per individual) for personal health services, all services, and by types of service (physician, hospital, dentist, prescribed and nonprescribed drugs).

The correlates examined included age, family income, and residence.

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Cross-tabulation of percentage distributions and graphs were used to analyze the data.

There was an increase of 42 percent in the amount spent per person per year for personal health services from 1953 to 1958. Even though the prices of various units of personal health services rose 18 percent, the increased expenditure due to increased use rose 20 percent. Hospital care and drugs accounted for almost two-thirds of the increase. A great deal of the increase may be ascribed to the age groups at both extremes — under 6 and over 65.

The higher the income, the greater was the proportion of families who had higher expenditures for each type of personal health service. Residents of SMSA's generally had higher expenditures than those outside an SMSA.

23. Antonovsky, A. and R. Kats, 1970. "The model dental patient: an empirical study of preventive health behavior." *Soc. Sci. Med.* 4 (November): 367-380.

This study attempted to assess the social-psychological determinants of preventive dental care seeking.

Interviews and dental records at Hadassah Medical Organization Dental Clinic, Jerusalem, provided the data.

The utilization indices employed were frequency of check-up visits and the recency of last contact for a check-up.

The authors examined the relationship of predisposing motivation variables (salience), effective motivation variables (benefit) and blockage variables (knowledge, anxiety, financial difficulty) to use.

A Chi-square test of significance was used to analyze the data.

The authors found no clearcut relationship between the variables and utilization. However, in the summary, they discuss how their model parallels the Rosenstock framework and suggest refinement in the measurements of these variables.

24. Avnet, H. H., 1967. *Physician Service Patterns and Illness Rates*. New York: Group Health Insurance, Inc.

This study described the patterns of physician utilization in a health insurance plan membership.

Individual records of the Group Health Insurance (GHI) membership provided the data.

Eleven general utilization indices used include general patterns, physician use, volume of services, general office visits, preventive visits, specialist consultations, home visits, diagnostic X-rays, laboratory procedures and ambulatory or hospital surgery.

General patterns included users versus non-users per 100 eligible members, site of the service (office, home, hospital) and the number receiving a specific type of service per 1000 patients (such as diagnostic X-ray, lab test, consultation, preventive service, home visit, or hospital admission).

Physician use measured the number of different physicians used per family, whether the attending physician was a GP or a specialist, and the proportion of selected services rendered by specialists (such as office visits, X-rays, ambulatory or hospital surgery).

Volume of services gauged the number of services per 1000 exposure years (a person-year represented the insurance coverage of one person for one year), per person and per family of two or more, and per person per 1000 members.

General office visits tabulated the frequency per 1000 exposure years of out-of-hospital physician and laboratory services, the total services per eligible member, total out-of-hospital services per eligible member (including general office visits and other out-of-hospital services), and general office visits per eligible member.

Users of preventive visits per 1000 exposure years were tabulated as were preventive visits per 1000 exposure years and per user.

Specialist consultations per 1000 exposure years and per 1000 resident members were counted.

The proportion of the membership using home visits was measured as were the rate of such visits per 1000 exposure years and visits per user.

Diagnostic X-rays reflected the proportion of the membership obtaining out-of-hospital X-rays and the number of procedures per 1000 exposure years and per patient.

Laboratory procedures included the proportion of the membership using out-of-hospital lab work (except urinalysis and hemoglobin tests) and the number of procedures per 1000 exposure years and per patient.

Ambulatory surgery included the proportion of the membership receiving this service and the number of procedures per 1000 exposure years.

The number of different patients per 1000 exposure years receiving hospital surgery was tabulated as were

the numbers of surgical procedures and surgical admissions per 1000 exposure years.

These use variables were examined for the correlates of age, sex, marital status, family size, duration of enrollment, diagnosis, the area of the subscriber's residence and occupational class.

Cross tabulation of percentage distributions and graphs summarized the data.

Findings revealed an average of 6.7 insured physician and out-of-hospital laboratory services per member during the study year. Those using services averaged 8.4 services each.

The greatest variation in total volume was shown for age-sex subgroups. The lowest utilizers were girls 10 to 14, and the highest were women 65 or more. Boys used more services than girls, especially in the teens, but this trend was reversed at age 20. Women, single or married, generally used more services at all ages than men.

Except for hospital medical care, married people of both sexes generally used more services than the single or widowed. The larger the family, the fewer were the services per person. The longer the period of coverage the higher was the service utilization rate. The difference may be attributable to age, however.

The service utilization rate varied by geographic residence. The proportion of members using any service and the total service volume revealed no pattern ascribable to social class. However, those involved in sales work had the highest utilization rate, by any measurement.

The highest proportions of specialist services occurred for hospital surgery and office X-rays. Professional groups used specialists for all types of service more than blue-collar groups.

One of the 6.7 services per eligible member represented in-hospital physician services. The majority (3.5) of the 5.0 out-of-hospital visits per person were general office visits. Consultations and out-of-hospital diagnostic tests accounted for one service per member. The ratio of all office services to reported home calls was about 6 to 1. The number of preventive visits was 230 per 1000 members.

Age, sex, occupational class and area of residence were the primary variables associated with the types of service sought. Marital status also seemed to have an independent influence. Age and sex may reflect physiological demand marital status and occupational class may reflect environmental influences.

The tendency for volume to rise with age was apparent for most types of service but much less pronounced for ambulatory care than hospitalization. Men past 65 used more hospitalization, particularly for

surgery, than did women, who had more office and home services. Older groups had fewer preventive services and more home visits than any other adult group. Young children had the highest rates of preventive visits and home calls.

Spouseless adults generally used fewer office services of all kinds than the married. Only in their use of hospitalization (admissions and length of stay) did subgroups of the unattached outdo the married. Surgery rates in and out of the hospital showed varying age and sex patterns.

The use of hospitalization was related to practically every variable tested, but admission rates and the length of stay were both lower than national averages reported for the same period. Two categories of diagnosis (circulatory and digestive disorders) contributed 42 percent of the total days listed for medical stays.

Neither the proportion of members using any service nor the total number of services used varied significantly among occupation subgroups; but occupational class may be an important factor in the use of diagnostic aids and preventive services as well as the use of specialists. There were also higher proportions of users of preventive services in all white-collar categories than in the blue-collar class.

25. Bashshur, R. L., *et al.*, 1971. "Some ecological differentials in the use of medical services." *Health Services Research* 6 (Spring): 61-75.

This study examined the impact of selected socio-demographic factors upon the direction and the distance of travel to various medical facilities, and showed that both socio-cultural and distance factors influence choice of medical facilities.

Interviews with people in a multistage probability sample of the metropolitan Cleveland area in the fall of 1967 asked about choice of facility and identified distances traveled to the facility.

The city was divided into sectors, and vectors labeled A, B, and C were drawn. "A" measured the distance from each residence to each hospital or medical service facility used. "B" measured the distance from a single facility to an average location of selected residences. "C" measured the distance from an average residence to an average facility. These distance variables were then used to determine the mean distances traveled to hospitals, physician or dentist offices.

Socio-economic background (color, education, income, religion) and reasons for choice of a particular facility were then examined for each of the travel patterns.

The method of data analysis was construction of travel vectors and cross-tabulation with the correlates.

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The "C" travel vector indicated that the distance from an average residence to an average hospital is greater for sectors more distant from the center, which reflects the central location of city hospitals.

A different pattern was demonstrated for the "B" vector from particular hospitals to the average location of residents in a sector. Travel to suburban hospitals is shorter than travel to the more centrally-located hospitals.

Relative to the "A" vector from each residence to each facility, more blacks went to Metropolitan General and more Jews to Mt. Sinai.

Other findings revealed that twice as many whites as blacks use the closest hospital. Jews traveled farther to the hospital of their choice; those with the highest incomes and educational levels traveled farthest because of their concentration in the outer zones. Those who emphasized quality of care or physician recommendation traveled farther to hospitals than those whose choice was based on proximity and modern equipment.

Travel distances to physicians' offices were slightly greater than travel to hospitals. Those with a college education, annual income over \$11,000, Jewish backgrounds, and residences in the suburbs traveled the farthest. But more blacks than whites traveled beyond the second-nearest physician. Friendliness as the basis of choice of a physician resulted in the longest travel distance; with convenience as the basis of choice the shortest distance was traveled.

Less marked differences in distance travel patterns were evident for travel to dentists.

26. Battistella, R. M., 1971. "Factors associated with delay in the initiation of physicians' care among late adulthood persons." Amer. J. Pub. Health 61 (July): 1348-1361.

This study attempted to determine whether delay in the initiation of physician care varies with age and selected social-structural and social-psychological characteristics for those over 45.

Information about persons over 45 from interviews in 1955 of an area probability sample of 1345 persons in Windsor, Canada, provided the data.

Level of delay was gauged by whether, for care initiated, the respondent had waited or sought care right away and, further, whether he had any complaints for which the doctor should have been consulted, but was not. The delay variable was then trichotomized into high, medium and low delay.

The relationship of selected social-structural and social-psychological variables to delay was examined. "Social-structural" correlates included economic location (family income, health insurance coverage, and medical indigence, that is whether the respondent relied on outside assistance or not), social location (education, occupation, ethnicity), and social isolation (whether the respondent lived alone or whether anyone in the household belonged to different types of community organizations).

"Social-psychological" variables were worry over health and perceived chance of recovery from serious disease.

A Chi-square test of significance was performed on the data.

The author found a propensity for all late adulthood persons to delay in seeking care.

Surprisingly enough, the proportion of persons delaying least was higher for persons in low-income families, persons without health insurance, and persons who are medically indigent, i.e., those with the lowest socio-economic status. Nor was there any evidence to suggest that delay decreases as social status rises. Socially isolated persons did not tend to delay longer than the non-isolated.

Persons who tend to worry about their health delay less than those who do not worry. Perceived chance of recovery is inversely related to delay.

27. Battistella, R. M., 1968. "Limitations in the use of the concept of psychological readiness to initiate health care." Med. Care 6 (July-August): 308-319.

This study assessed the impact of psychological readiness on the seeking of medical care services.

Information about persons over 45 from interviews in 1955 of an area probability sample of 1345 persons in Windsor, Canada, provided the data.

The utilization measure was the recency of the respondents' last visit to a physician (1 year or less, 2-5 years, 5 years or more), whether or not the respondents had a preventive general exam within 2 years, and the level of delay (high, medium, low).

A Chi-square test of significance and Cramer's V measure of dependence were used to analyze the data.

Psychological readiness was based upon what respondents said they would do if confronted with a number of hypothetical illness situations - would they wait or go to the doctor right away.

This test of the relationship between the measures of frequency and promptness of visits to physicians, in agreement with previous studies, indicates that low-readiness persons are slow to initiate care than are high-readiness persons. However, when tested for strength, the relationship was not found to be practically significant. Similarly, when the results in previous studies were examined for strength of the relationship (using Cramer's V), these relationships were also not found to be practically significant.

The concept of psychological readiness appears to be of little explanatory significance, at least as presently conceptualized, in accounting for individuals' initiation of health care services.

28. Bergner, L. and A. Yerby, 1968. "Low income and barriers to use of health services." *New Eng. J. Med.* 278 (March 7): 541-546.

The authors proposed to document the lower utilization of health services by the poor and to offer some policy foci for correcting these differentials.

Data came from a study conducted by the New York City Health Department in 1969.

The percent of children 1 to 4 years of age who were fully immunized was examined for different family income categories.

Cross-tabulation of percentage distributions was used to analyze the data.

The percentage of immunizations increased as income increased. The authors also cite evidence from the National Health Survey documenting the lower utilization and higher morbidity rates for low-income persons. They argue that Medicare and Medicaid will not erase these differences. Increasing attention must be directed toward making potential clients aware of existing services, improving the organization and administration of public health programs and training health professionals to provide services more effectively.

29. Bice, T. W., 1971. "Medical care for the disadvantaged: report on a survey of use of medical services in the Baltimore Standard Metropolitan Statistical Area 1968-1969." Final report of research conducted under Contract Number HSM 110 69 203, NCHSRD.

This study described the association of economic class with various utilization measures as well as with various need, enabling and predisposing variables.

Data came from interviews during a household survey of the Baltimore SMSA from June, 1968 through May, 1969 as part of WHO/ICS-MCU.

Utilization was divided into physician, hospital and dentist use. Physician use included a physician visit in the past year and within the past two weeks as well as a general physical exam within the past year. Hospital use included a hospital admission within the past year and the number of hospital admissions per 1000 persons. Dentist use included having a dentist visit within the past year.

The correlates were economic class and need, enabling and predisposing variables.

Economic class (based on family size and income) was defined as high-income, low-income or poor.

The need for care variable included a chronic health problem which did or did not cause disability, the severity of a recent illness episode and the number of disability days during the past two weeks.

Enabling variables included net price (whether the respondents paid none or some or all of their expenses out-of-pocket); third-party coverage (voluntary coverage, social insurance such as Medicaid and Medicare only, or non); and availability of care (density of physicians within geographic areas, distance in time to the nearest physician and regular source of care, and the distance in time to that regular source of care).

The predisposing variables were perceived availability of care, skepticism of medical care, years of schooling, and tendency to use services.

Cross-tabulation of percentages, AID analysis and multiple regression were used to analyze the data.

This study affirmed the influence of economic class upon the use of medical services and further refined the importance of need, enabling and predisposing components and their relationships to this class variable.

Findings relative to economic class and use of services showed the percentage of high-income persons who visited a physician within the year exceeded that of the poor, as did the percentages for the general physical exam variable. Poor persons were more likely to have visited a physician within two weeks. There seemed to be little difference among different economic classes in the percentage having at least one hospital admission within the year, but poor adults had higher admission rates per 1000 than high-income adults. Fewer than one in three poor persons visited a dentist within the year.

Relative to economic class and need, the poor were more likely to have a chronic health problem and to report illness within the past two weeks; while the high-income used more services than the low-income, more poor used a service in response to illness.

Relative to economic class and the enabling variables, the percent of persons who paid nothing out-of-pocket for medical services was largest among the poor (due to Medicaid and Medicare). The poor under 65 were less

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likely than the more affluent to have any insurance coverage. Generally, the poor were slightly more likely than others to reside in areas with low physician densities or to have no regular source of care. No relationship was found between economic class and distance.

Economic class was not significantly related to any of the predisposing variables except years of schooling.

30. Bice, T. W. and R. L. Eichhorn, 1972. "Socio-economic status and use of physicians' services: a reconsideration." *Med. Care* 12 (May-June): 261-271.

This paper reappraised the changing relationship of socio-economic status to utilization of physician services.

The authors' conclusions were drawn from a review of current literature and NCHS data.

Their interpretation of changing physician use patterns was based on the average number of physician visits per person per year.

Need for care included self-reported illness and perceived symptoms.

Psychological readiness to initiate care, health beliefs, and medical orientation comprised the predisposing variable.

Enabling factors were income, insurance coverage and net price of physician services; the distance to a source of care; and organizational barriers.

The authors concluded that the traditional relationship between income status and the use of physician services has steadily diminished over the past four decades as the gap between high and low income groups narrows.

Changes in the mode of financing medical care such as Medicaid and Medicare were said to have caused this changes relationship.

Need, predisposing and alternative enabling factors were discounted as yielding vague or inconclusive explanations. Only for preventive service utilization (especially for children who are the largest users of preventive services) may the traditional positive relationship between income and use of physician services still be said to be apparent.

31. Bice, T. W. and K. L. White, 1971. "Cross-national comparative research on the utilization of medical services." *Med. Care* 9 (May-June): 253-271.

In this article Bice and White proposed a framework for assessing how different forms of organization and/or financing and/or modes of medical practice affect rates and patterns of utilization.

It is a significant statement of some of the major conceptual, theoretical and methodological concerns that will accompany attempts to do collective, system-level comparative research on utilization.

Utilization studies may be of three primary types: 1) analysis of the variables associated with different rates of use (entry); 2) focus on the patterns of patients' movements through the different components of the system (flow); and 3) the result (outcome) of those movements through the system.

In cross-national research, the investigation is concerned with 1) describing or explaining volumes of and/or reasons for entry, flow and outcome within at least two nations and 2) comparing these across nations.

Four types of comparative studies may be delineated, based on the intersection of two variables: whether or not system-level, global properties are employed as analytical variables; and whether the dependent variable is an aggregative univariate measure of use (rate) or a relationship between unit-level variables (relationship between social class and use).

The authors suggested that comparative studies designed to test hypotheses concerning the impact of specified variables on utilization must consider use as a multi-dimensional concept. Three general considerations are of primary importance: 1) the component of use (e.g., physician, hospital); 2) the patient's motivation for seeking care (e.g., preventive, therapeutic); and 3) point in a series of contacts (e.g., entry, follow-up). If meaningful comparisons of use are to be made in cross-national comparative research, special attention should be directed to the development of functional equivalents for each of these elements.

The authors pointed out the limitations of such frameworks as Feldstein's model of demand for medical care, Andersen's model of families' use of services, and Rosenstock's social-psychological model. Use of these models is not always salient for describing collective, system-level properties that are associated with use such as the organization of primary care (solo or not) and modes of reimbursement.

The authors expressed concern that the current methodology achieve equivalence of meaning when constructing indices and analyzing the outcomes of comparative research. They urged investigators to avoid the fallacy of ecological correlations that may result when aggregate data are used in comparative research.

32. Bice, T. W. and K. L. White, 1969. "Factors related to the use of health services. an international comparative study." *Med. Care* 8 (March-April): 124-133.

This study examined the impact of specified factors on utilization of physicians' services in three different international populations.

Interviews with all adults and children in the households of a sample of non-institutionalized civilian populations in Chester, England; Chittenden County, Vermont, U.S.A.; and the commune of Smederevo and its sub-region, Yugoslavia, were conducted as a part of WHO/ICS-MCU.

The use of physicians' services within the past two weeks was the utilization index.

Eight correlates were examined: age; sex; occupation of the head of the household; perceived illness (based on restricted days and discomfort); availability of a regular source of care (if the respondents had a regular source of care and the distance to this source); private health insurance status; a consideration of the tendency to use medical services (based on responses to hypothetical health problems); and use of non-prescribed drugs within the two days prior to the interview.

AID was used to analyze the data.

The authors found that the levels of perceived illness accounted for the greatest amounts of variance in utilization. Within each area, persons with high levels of perceived illness who expressed high tendencies to use

services were more likely to visit a physician than those with low scores on this measure. Though the pattern varied in each area, the occupational level of the head of the household was also related.

In addition to these factors, availability of care in Smederevo explained differences in use of physicians' services there.

See also: NCHS, 1969. "International comparisons of medical care utilization: a feasibility study." Series 2, Number 33.

33. Bice, T. W., et al., 1971. "Economic class and use of physicians' services." Unpublished manuscript. Johns Hopkins University: Department of Medical Care and Hospitals.

This study examined the impact of specified need, predisposing, and enabling variables upon use of physician services in an urban area.

Interviews during a household survey of the Baltimore SMSA from June, 1968 through May, 1969 as part of WHO/ICS-MCU provided the data. The utilization

indices were overall use of physicians' services within a year, and whether or not a general physical exam was sought in a year.

A chronic health problem defined need. Predisposing variables were tendency to use services for psycho-social problems, education, perceived availability of care and regular source of care. Enabling factors included whether the individual had insurance, whether he paid none or some or all of his expenses out-of-pocket, and his income.

AID and multiple regression analysis were employed to analyze the data.

A regular source of care was the best predictor of overall use of physicians' services for both high-income and poor adults. However, the poor who pay nothing out-of-pocket for physicians' services were more likely to have visited a physician within the past 12 months than those who pay some or all of their expenses themselves.

Among the poor, education appeared to be a significant determinant of whether or not an individual had a general exam within the year.

The authors concluded that government programs which reduced financial barriers to the utilization of physicians' services, had altered somewhat the use of health services by the poor. However, even with these barriers removed, non-economic factors, such as education were still likely to inhibit the poor's seeking of preventive health services.

34. Brightman, I., et al., 1958. "Knowledge and utilization of health resources by public assistance recipients." *Amer. J. Pub. Health* 48 (February):188-199.

This study appraised the knowledge and utilization of health services by public assistance recipients.

Three study groups from the population of Syracuse, New York provided the data. The first, a basic study group, was comprised of families on AFDC for at least eight months of the study year. Two comparative groups consisted of families not on AFDC in a low-income housing project and a higher income group of families of employees in a single industry in Syracuse earning between \$5000 and \$7500 per year.

Four measures of use were reported: the receipt of school health services, the utilization of selected community health services, the type of immunization and child health supervision sought, and the use of maternity services.

School services included the percent of children examined by a physician or receiving vision and hearing tests and dental hygiene exams; the percent of exam-

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inees receiving recommendations, and the percent of recommendations followed.

The percent of all households and the percent of all persons (or children) who used community services such as immunization or orthopedic clinics, X-ray facilities, or child health conferences were tabulated.

Maternity service use included the time of the first exam, receipt of prenatal and postpartum care, the frequency and number of physician visits, and the number of home nursing visits.

These different kinds of use and the knowledge and sources of health information were examined for the three study groups.

The data were analyzed using cross-tabulation of percentage distributions.

There were no striking differences among the three study groups in the knowledge or utilization of school health services, though the middle-income had a slightly higher follow-up on recommendations.

Knowledge of community health services seemed adequate among the three groups. However, the lower income groups tended to use the mass X-ray program less.

There appeared to be no gross differences in children's immunizations and use of health services.

AFDC women applied for maternity care much later in pregnancy and made fewer visits than the two comparative groups. The proportion of women in both low-income groups failing to receive postpartum care was much higher than in the middle-income group. The low-income women also had a higher rate of home nursing care.

There were no significant relationships between the mode of practice or type of sponsorship of the insurance programs and the outcome of the school referral. Children in families in group practice plans were more likely to have had a general exam than those in solo practice plans. Low-income families in group practice plans were more likely to obtain preventive exams than low-income families not in such plans.

In examining the receipt of health care for insured and noninsured persons according to diagnostic groupings, the percentages seeking care were greater for medical than for dental and other conditions seldom covered by insurance.

Noninsured families were more likely to be of low social rank (low income and education) and of deprived minority ethnic background - which may account for some of the referral outcome differences for the insured and noninsured.

35. Cauffman, J. G., et al., 1967. "The impact of health insurance coverage on health care of school children." Pub. Health Rep. 82 (April):323-328.

This study assessed the impact of health insurance coverage on the outcome of referrals of children from school health clinic examinations.

School health clinic records and interviews conducted during 1963-1964 with parents of 458 fourth-grade children from different socio-economic ranks in 48 Los Angeles city schools provided the data.

The utilization index was whether or not children received medical and/or dental care following a referral from the school clinic.

The correlates were whether or not the families had insurance, and if they had, the mode of practice (individual or group) and the type of sponsorship (commercial or provider) of the insurance; the socio-economic rank of the family, their ethnicity; and the father's education.

Findings showed that insurance coverage had a significant impact on the decision to seek professional medical help.

Slightly more than half of the children in families with insurance received medical care and 37.7 percent of children in families without insurance received attention.

When controlled for socio-economic rank, however, higher income families obtained care for their children with or without insurance; this was not true for the low-income families.

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36. Cauffman, J. G., et al., 1967. "Medical care of school children: factors influencing outcome of referral from a school health program." Amer. J. Pub. Health 57 (January): 60-73.

This study assessed the impact of various socio-economic, attitudinal and notification factors upon the outcome of referral of children from school health clinic examinations.

School health clinic records and interviews conducted with parents of 458 fourth-grade children from different socio-economic ranks in 48 Los Angeles city schools in 1963-64 provided the data.

The utilization index was whether or not children received medical and/or dental care following a referral from the school clinic.

Socio-economic status, attitudinal variables and notification methods were examined for the study population.

The socio-economic factor included social rank; parents' education, occupation, and ages; family size; ethnicity; religious preference; attendance at religious services; and parents' birthplaces.

Attitudinal variables included parents' urgency about the defect as it affected schoolwork, friendships, and family happiness. The number of notifications and the contact technique were also noted.

Multiple regression techniques were used to analyze the data.

The findings reveal that the three best predictors of the outcome of a referral were notifications, social rank and parents' urgency rating, in decreasing order of importance.

Children were more likely to receive attention if:

- They were from a high social rank
- They were members of small families
- Their parents were Caucasian or Oriental
- Their parents had education beyond high school
- Their parents were employed in white-collar occupations
- They were members of families with non-working mothers
- Their mothers were over 35 years of age
- Their parents had a Jewish religious preference
- Their parents attended religious services once a month or less
- Their parents perceived the defect to be of high urgency
- Their parents received more than one notification
- Their parents were notified by more than one person
- Their parents were notified by more than one contact technique

Children were less likely to receive attention if:

- They were from a low social rank
- They were members of large families
- Their parents were Negro or had a Spanish surname
- Their parents had a high school education or less
- Their parents were employed in blue-collar occupations
- They were members of families with working mothers
- Their mothers were 35 years of age or younger
- Their parents attended religious services more than once a month
- Their parents perceived the defect to be of low urgency
- Their parents received only one notification
- Their parents were notified by only one person
- Their parents were notified by only one contact technique

37. Clausen, J. A., et al., 1954. "Parent attitudes toward participation of their children in polio vaccine trials." Amer. J. Pub. Health 44 (December): 1526-1536.

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This study appraised the characteristics and attitudes of mothers that influenced the participation of their children in polio vaccine trials.

Interviews with a random sample of mothers of second-graders in five public schools in a northern Virginia county near Washington, D.C. provided the data.

The percent of mothers who gave consent for their child to participate in the polio vaccine trial was the utilization index.

The correlates were mother's education level; her overall sources of information (leaflets sent home from school, newspapers, magazines, radio, TV); her source of initial information (school, child, friends and neighbors, newspapers); the extent to which mothers discussed shots with others; her attendance at orientation meetings; her feelings about polio and her personal contact with polio; her doubts about the safety of the vaccine; her opposition to the child's taking shots; and her general attitude toward the program and its objectives.

Cross-tabulation of percentages were used to analyze the data.

Findings revealed that education largely accounted for the differences between mothers who gave consent for their child's participation and those who did not.

Mothers who gave their consent were likely to be better educated as well as to have obtained their overall and initial information from printed sources, talked with others about the trials, and attended orientation meetings. They were also slightly more likely to have a close friend or relative who had the disease.

Doubts about the safety of the vaccine was the most likely reason for withholding consent. A number of those who withheld consent were simply against the child's taking shots.

38. Coe, R. M. and A. Wessen, 1965. "Social-psychological factors influencing the use of community health resources." Amer. J. Pub. Health 55 (July): 1024-1031.

This review of the relevant literature summarizes some social-psychological factors that influence the use of medical services, with special emphasis on the interaction between the health personnel and patients.

The authors suggest that some of the conditions imposed by the contemporary practice of medicine may be threatening to the patient and account for the resistance to seek services from modern practitioners.

Among these conditions are the extreme impersonality of the encounter, skepticism about the physician's competence, and the inability to establish the old family-doctor relationship.

39. Coe, R. M., et al., 1967. "The impact of Medicare on the utilization and provision of health care facilities: a sociological interpretation." Inquiry 4 (December): 42-46.

This is a discussion of some of the potential social-psychological impacts of Medicare upon utilization and provision of facilities.

Coe, et al., suggest several social-psychological interpretations which might be given to the altered utilization of health services subsequent to Medicare.

They hypothesized that Medicare will "alter the norms defining the appropriateness of seeking professional care for symptoms that had not previously been defined as illness." If this is the case, the increase in utilization will come later than expected because of the lag in the change of normative definitions compared with technological innovation.

Another hypothesis was that Medicare will encourage the development of a sick role that is "non-deviant," and, therefore, the incumbent will feel freer to seek frequent treatment from professional sources.

40. Colver, A., et al., 1967. "Factors influencing the use of maternal health services." Soc. Sci. Med. 1 (September): 293-308.

This study assessed those background characteristics that influence mothers seeking maternity care.

Interviews with a sample of obstetric patients in two Detroit hospitals, February-November, 1964, provided the data.

The number of prenatal visits, postpartum clinic attendance, and the percentage who obtained family planning services comprised the utilization indices.

Correlates included the mothers' age, number of living children, marital status, education, race and religion.

Cross-tabulation of percentage distributions were used to analyze the data.

Some characteristics were associated in quite different ways with the rates of use of the different services. For instance, the fewer the number of previous births, the higher was the use of prenatal and postpartum care; but women with large families more often sought family

planning services. The use of prenatal and postpartum services tended to increase with age, but older women tended to have low rates of family planning attendance.

Other variables had consistent relationships with all three services. Married women were more likely to attend all of the clinics than unmarried women. More education tended to increase the likelihood of making use of all three services Negroes were more likely than whites to attend the clinics. However, the remaining variable, religion, had a somewhat mixed relationship with the use of maternal health services.

41. Darsky, B. J., et al., 1958. *Comprehensive Medical Services under Voluntary Health Insurance: A Study of Windsor Medical Services*. Cambridge: Harvard University Press.

This study described the experience of the Windsor Medical Services, Windsor, Canada, a comprehensive medical society-sponsored fee-for-service insurance plan that provides benefits for physician care in the home, office or hospital.

Interviews with an area probability sample of 1345 people in the metropolitan Windsor area in 1954 provided the data.

The utilization indices included both physician and hospital use.

Physician use included home and office services (the numbers of services and persons and the average numbers of services) and home and office visits involving and not involving hospitalization (the numbers of services and persons and the average numbers of services of both).

Hospital use was determined by the number of admissions per 100 persons, the number of days per admission, and patient days per 1000 persons per year.

The correlates included the subscriber's status (whether the respondent was a member of the Windsor Medical Services Plan, a non-subscriber or a member of some other plan); age; sex; income; and education.

A cross-tabulation of percentage distributions and graphs were used to analyze the data.

The main effect of WMS on utilization of home and office services is to increase the proportion of people who initiate care.

There appears to be no difference between the WMS and other plans regarding the use of physician services for illness not involving hospitalization.

The uninsured have a much lower hospital admission rate than those enrolled in WMS or other plans, but a longer average length of stay. The average WMS subscriber obtains about 1.2 services during the year in home or office calls for care involving hospitalization. A

similar average of 1.0 holds for subscribers to other prepayment plans.

Non-subscribers, however, use an average of only .67 services, reflecting a generally lower utilization of hospital care by this group.

When only those who have been hospitalized are considered, those who are not insured have a much higher number of home and office visits (9.88) than WMS (7.36) or other plan members (5.41).

The authors conclude that people without insurance use the hospital more sparingly than others, but once they require a hospital stay, they receive a more extended sequence of home and office care.

42. Deasy, L., 1956. "Socioeconomic status and participation in the poliomyelitis vaccine trial." ASR 21 (April): 185-191.

This study assessed the impact of socio-economic status on children's participation in the polio vaccine trials.

Interviews with a random sample of mothers of second-grade children in five public schools in a northern Virginia county near Washington, D. C., provided the data.

The utilization index was the percent of mothers who gave their consent for their child to participate in the polio vaccine trials.

The correlates reflected the mother's socio-economic status, her previous experience relating to polio, and the amount of information she had about the vaccine. Socio-economic status was divided into three levels: 1) husbands who were college-trained professionals married to college-trained wives; 2) professionals and skilled workmen (three-fourths of the men and women had either graduated from high school or gone beyond); and 3) skilled workmen or below who were not high school graduates married to women who were less than high school graduates.

A cross-tabulation of percentage distributions was used to analyze the data.

Mothers in the lowest status group were less likely to allow their children to participate in the Salk vaccine trial. They knew less about the trial and they demonstrated a lower level of awareness of the disease itself.

However, the precise motivational and attitudinal components within each of these classes accounting for these differences remains to be specified.

43. Densen, P. M., et al., 1959. "Concerning high and low utilizers of services on a medical care plan, and the persistence of utilization levels over a three-year period." Milbank Mem. Fund. Quart. 37 (July): 217-250.

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This study tried to determine the characteristics of high and low users of a prepaid group practice plan over a three-year period.

The records of the HJP membership provided the data.

The number of physician services received was the utilization index.

Correlates included age, sex and family size.

A cross-tabulation of percentage distributions was used to analyze the data.

Consistent high utilizers and nonutilizers were found in each age-sex group over the three-year period. Children were the least likely to be either high utilizers or nonutilizers during the year. The reverse situation occurred among persons 60 years of age or older. This age group had the highest proportions of high and low utilizers when utilization was measured over a single year or over a longer period of time.

Data by family size identified the one-person unit as having more low-utilizers than any other type of family and having the greatest year-to-year consistency in low utilization.

44. Densen, P. M., et al., 1962. "Prepaid medical care and hospital utilization: comparison of a group practice and self-insurance situation." *Hospitals* 36 (November 16): 63-68; 138.

This study compared the hospitalization rates for enrollees in a group practice and a fee-for-service plan.

Records of a sample of members of HIP of New York (a prepaid group practice plan) and of District 65 Union Plan (a fee-for-service insurance plan) supplied the data.

The utilization indices were the annual hospital admission rates per 1000 population and per 100,000 population and the length of stay per admission and per 100 population.

The correlates were age, sex and membership in either HIP or District 65 Union Plan.

Cross-tabulation of percentage distributions was used to analyze the data.

There were no differences between the group practice and the fee-for-service enrollees in rates for admissions and length of stay. For both populations studied, however, the hospital admission rates were much lower than the admission rates in previous studies involving non-HIP members.

See also:

Densen, P. M., et al., 1958. *Prepaid Medical Care and*

*Hospital Utilization.* Hospital Monograph Series, No. 3. Chicago: American Hospital Association.

Densen, P. M. and S. Shapiro, 1963. *Hospital Use Under Varying Forms of Medical Organization.* Conference on Research in Hospital Use. PHS #930-E-2. Washington, D.C.: U.S. Government Printing Office.

45. Densen, P. M., et al., 1960. "Prepaid medical care and hospital utilization in a dual choice situation." *Amer. J. Pub. Health* 50 (November): 1710-1726.

This study assessed the impact on hospital utilization of two different organizational and financial forms.

Medical and administrative records of Associated Hospital Service of New York (Blue Cross) provided the data. These records were for those members of locals 10, 22, and 89 of the International Ladies Garment Workers Union who were subscribers continuously to either HIP or GHI during the period July 1, 1956 through June 30, 1957.

The utilization indices were annual hospital admission rates, surgical and non-surgical, per 1000 population and the length of stay per admission and per 100 population.

The correlates included age, sex, diagnosis and membership in either GHI or HIP.

A cross-tabulation of percentage distributions was used to analyze the data.

Annual hospital admission rates, adjusted for the population composition of the two groups, were 70.2 per 1000 for HIP and 88.3 per 1000 for GHI. The biggest difference was for female surgical admissions, with HIP having the lower rate. The female non-surgical rate was also lower in HIP. When the data were analyzed by diagnosis the admission rate for females in HIP is lower than females in GHI.

There was little difference in the average length of stay per admission - 10.4 days for HIP and 10.8 for GHI. The average number of paid days per 100 population, after adjustment, was 74.4 for HIP and 95.5 for GHI, reflecting the difference in admission rates.

The authors concluded that further data is required to account for these differences. Are the differences, they ask, an artifact of the self-selection process into the respective programs or a true outcome of organizational and financial models of health services delivery?

46. Diokno, A. W., 1962. "Relationship between benefit levels and hospital utilization." In McNerny, W. J., et al. *Hospital and Medical Economics.* Chicago: Hospital Research and Education Trust.

This study tested the hypothesis that the utilization of hospital facilities varies directly with the degree of insurance coverage.

Claim data from employees' insurance records of four companies which provided different types of insurance coverage for their employees yielded the data.

The utilization indices were claims experience (number of claims, claim rate), the average length of stay in days and the total number of hospital days used.

The different types of coverage included indemnity, Blue Cross-Blue Shield, and major medical.

A cross-tabulation of rates and percentage distributions was employed to analyze the data.

Findings revealed that claims rates and total number of hospital days used were less under the indemnity plan which provided fewer benefits.

47. Dodge, W. F., et al., 1970. "Patterns of maternal desires for child health care." Amer. J. Pub. Health 60 (August):1421-1429.

This study appraised maternal desires for child health care in a southwestern county.

Household interviews with a 12 percent random sample of the mothers of children enrolled in first, second and third grades of the public schools of Galveston County, Texas, during 1967-68 provided the data.

Three utilization indices included the rank of the relative importance of several preventive health measures such as screening tests, immunization, health education; whether or not the child had specified immunizations and screening tests and from whom; and the mother's belief about who should provide each of these health measures.

The correlates examined were ethnic group, socio-economic level, annual family income and the mother's education.

A cross-tabulation of percentage distributions was used to analyze the data.

The authors concluded that current maternal opinion and desires are matched by current performance.

There seem to be no significant differences among the different ethnic groups, socio-economic levels, income levels, or educational levels in the assignment of relative importance to each of the health measures.

However, a comparison of the source utilized in the past with the currently preferred source shows marked differences when analyzed by demographic characteristics. In the past socio-economic level and the mother's education were directly related to the mother's using a private health source instead of a public health source.

In this study, for preferred source of care, these relationships were not statistically significant, leading to the conclusion that little demographic differences currently exist for patterns of maternal desires for child care.

Performance based on current desires was reflected in the relative utilization of recently emphasized health measures versus those that have been advocated for many years. In Galveston County, measles vaccine and tuberculosis skin tests were some of the more recent health measures. The study revealed no significant demographic differences for children who received the skin tests. Even more revealing is the larger proportion of Negro children and children in families with less than \$4,000 annual income who were recipients of measles immunization.

48. Donabedian, A. and L. S. Rosenfeld, 1961. "Some factors influencing prenatal care." New Eng. J. Med. 265 (July 6): 1-6.

This study assessed the impact of socio-economic and related factors on mothers' seeking of adequate prenatal care.

Self-administered questionnaires during a prenatal care survey conducted on the second or third post-partum day to all mothers who were delivered in a selected group of Boston Metropolitan Area hospitals during part of June, 1956 provided the data.

Two measurements comprised the utilization indices: the percentage receiving an adequate quantity of prenatal care (determined by consultations with obstetricians) and the percentage visiting a dentist at least once during pregnancy.

The correlates were income, education, knowledge or opinion, and previous experience (based on questions such as "When should care be initiated?"), source of care (private physician, clinic) and content of prenatal care (pelvic exam).

A cross-tabulation of percentage distributions was used to analyze the data.

Though the data are somewhat fragmentary, findings from this analysis suggest that the adequacy of prenatal care is related to socio-economic status.

The data and methodology employed here do not permit substantial refinement of the interactions among variables, but findings do suggest that women with better education and higher income receive better prenatal care. A similar analysis for dental care suggests that women with higher educational levels may be more likely to receive dental care during pregnancy.

The majority of the women who had one or more children knew that prenatal care should be initiated

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during the first trimester of pregnancy, but the proportion who do see a doctor this early is appreciably less than the proportion who say they should. Women with lower income and educational levels occur in smaller proportions in each of the "do" and "should" categories.

Eighty-two percent of the women who went to a private physician were judged to receive adequate care, compared with 41 percent of the clinic patients.

49. Durbin, R. L. and G. Antelman, 1964. "A study of the effects of selected variables on hospital utilization." *Hospital Manage.* 98 (August): 57-60.

This article reports a study of selected medical resource variables on hospital utilization.

Statistical data came from the Hospital Administrators' *Guide Issue* for August, 1961; from the Research Division of the AMA; from the *Source Book of Health Insurance Data*, 1961; and from the *World Almanac and Book of Facts*, 1962.

The utilization indices were admission rate per 1000 persons per year and the average length of stay in days.

Correlates included the number of beds per 1000 persons, the number of physicians per 100,000 persons, the percentage of the population covered by insurance and per capita income.

A multiple regression analysis was employed to analyze the data.

Admission rates increased very rapidly as the number of beds increased.

Admission rates appeared to decrease as the number of physicians or per capita income increased. The rates did increase very slightly as the proportion of people covered by health insurance increased, though this finding is not a strong one.

Length of stay increased with each of the variables, though those with health insurance were more likely to have longer stays.

50. Ellenbogen, B. L., et al., 1968. "The diffusion of two preventive health practices." *Inquiry* 5 (June): 62-71.

This study gauged the diffusion of two preventive health practices among a panel of rural adults over an eight-year period.

Interviews with an area probability sample in the rural areas of six upstate New York counties in 1950-51 and again in 1957-59 provided the data.

Preventive medical and dental exams comprised the utilization indices. The definition of a preventive medical exam was a checkup not in connection with a somatic or emotional condition nor for employment, insurance, or educational purposes. The preventive dental exam was for a checkup not in connection with an oral condition, and excluded people with dentures.

Chronological age and education comprised the correlates. The age categories were young (20-34), middle (35-54) and old (55+). Education categories were high (12 years of schooling or more) and low (less than 12 years).

A Chi-square test of significance, phi coefficients, and zero-order correlations were used to analyze the data.

While acceptance of routine physical and dental exams increased significantly over the eight years, the level of utilization at the end of the period was less than one would expect if universal acceptance were general.

A significant rise in the acceptance of both practices occurred between the two points in time for the young and middle-age groups, but not for the old.

The author suggests that if the two practices were actually in the process of diffusion the relationship between use and age would, in fact, decrease over time. The data, however, suggest that the diffusion, measured in this way, occurred only with respect to a preventive dental exam.

Education was controlled to determine whether differential use among the age groups was maintained when the level of opportunity was held constant. The pattern of fusion with education controlled reveals that a decrease in differences in acceptance among the age groups exists only with regard to having a preventive dental exam for those persons with high education.

51. Falk, I. S., 1933. *The Incidence of Illness and Receipt and Costs of Medical Care among Representative Families: Experiences in 12 Consecutive Months During 1928-1931*. Chicago: University of Chicago Press.

This study is a classic first statement of the morbidity, utilization, and costs of medical care patterns in the United States.

52. Feldstein, P. J., 1966. "Research on the demand for health services" *Milbank Mem. Fund. Quart.* 44 (July): 128-162.

Feldstein proposed a model of demand for health care, based upon patient characteristics and physician choice of particular components of care (hospitals, nursing homes, referrals to specialists, etc.).

Need, cultural-demographic and economic factors all affect patients' demands for treatment. Need may be defined as incidence of illness. Cultural-demographic factors include age, sex, marital status, family size, education and residence. The economic factors that affect the patients' demand include net price (the out-of-pocket price affected by health insurance, free care, tax deductibility and sliding scales) and income.

For the income variable the relationship between medical expenditures and normal (permanent) income provides the most useful estimate of patients' demand. Removing the effects of transitory income from reported estimates would greatly improve estimates of the effect of normal income.

In addition to the patient characteristics described above, a number of factors influence physicians' use of different components of care:

- 1) institutional arrangements available to the physician;
- 2) the extent of the physician's knowledge of different methods of treatment; and
- 3) the relative costs to the physician of employing the different components of care, which may be affected by different organizational forms of practice in which physicians are involved.

53. Feldstein, P. J. and J. W. Carr, 1964. "The effect of income on medical care spending." Proceedings of the Social Statistics Section, American Statistical Association: 93-105.

The purpose of this study was to determine empirically the average net effect of income on private expenditures for personal health care.

Interviews from the Falk and Anderson surveys and analysis of business statistics from the U.S. Bureau of Labor Statistics and Health Insurance Institute Data provided the data.

The utilization index was medical care expenditures.

The correlates included were income (permanent or transitory), socio-demographic variables (age, sex, marital status, education, and family size), and price (differences in charges based on ability to pay, eligibility for free care, tax deductibility, insurance coverage, and group plan membership).

Regression analysis was employed to analyze the data.

A family's level of consumption is determined primarily by its expected normal (or permanent) income rather than its transitory income.

Age, sex, and marital status were considered proxy variables of physiological conditions; education and

family size as measures of perception, attitude and effect on health status; and the family size as an adjustment to the income variable.

Price differences related to ability to pay and eligibility for free care were likely to raise the measured income elasticity. Each of the variables must be controlled if the relationship of income to medical care expenditures (income elasticity) is to be refined and compared over time.

In 1950, unadjusted cross-section data indicated an income elasticity of 0.7. Allowance for the transitory component of income raised the elasticity measure to over 1.0. When the 1960 average was corrected for transitory income and the spread of health insurance, the estimated elasticity was increased from the original unadjusted of less than 0.7 to 0.883.

54. Feldstein, P. J. and J. J. German, 1965. "Predicting hospital utilization: an evaluation of three approaches." *Inquiry* 2 (June): 13-36.

This study described and evaluated each of three approaches for predicting hospital utilization.

The hospital utilization measure was the number of patient days per 1000 population in non-federal, short-term hospitals.

The authors suggested three basic approaches to predicting hospital utilization (future patient-day/population ratios): 1) extrapolating past patient-day/population ratios (trend line extrapolation); 2) extrapolating past bed-population ratios (because changes in supply lead to changes in demand); and 3) estimating the demand relationship of the patient-day/population ratio by analyzing socio-economic factors affecting utilization.

They formulated each of these approaches into a statistical model for testing their predictive utility. They then evaluated each approach according to the following criteria: How well does each technique predict? How flexible is each model for incorporating changes? How useful is it for hospital planners?

Regarding the ability of each approach to predict the actual patient-day/population ratios, the trend in patient-days per 1000 and beds per 1000 was more accurate than the demand analysis. Demand analysis, however, had the greatest ability to incorporate changes which might occur.

At present, the use of past trends in patient days and beds is the easiest approach for hospital administrators to use to predict utilization.

55. Fink, R., et al., 1968. "The reluctant participant in breast cancer screening programs." *Pub. Health Rep.* 83 (June): 479-490.

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This study described factors contributing to reluctance to participate in a cancer screening program.

Face-to-face and telephone interviews with a sample of participants and non-participants in a breast cancer screening program at HIP from December, 1963-December, 1964 provided the data.

The utilization index was participation in the screening program.

The correlates included demographic characteristics, previous use of medical services, self-ratings of health, attitudes toward screening, views of cancer, and concern about breast cancer.

The demographic characteristics included age, marital status, education, religion, ethnic group, family income, native or foreign-born, occupation, work status, and travel time to the facility.

A cross-tabulation of percentage distributions and an unspecified test of significance were used to analyze the data.

Findings revealed that screening participants tended to be younger, better educated and to include more Jews and fewer Catholics than non-participants. The participants were more likely to have seen a HIP physician within the past year.

There appeared to be no significant relationship between self-ratings of health and participation. Participants, in general, were more likely to report favorable attitudes toward the screening exam, to be concerned with the possibility of having cancer and to report specific symptoms associated with breast cancer.

56. Fitzpatrick, T. B., et al., 1962. "Character and effectiveness of hospital use." In McNerny, W. J., et al., *Hospital and Medical Economics*. Chicago: Hospital Research and Educational Trust.

This study described the character and effectiveness of hospital utilization in the state of Michigan and suggested schemes for classifying hospital use and its correlates.

Hospital discharge records from a probability sample of discharges in Michigan provided the data.

The authors suggested the following as basic measures of hospital use: 1) length of stay; 2) number of days of hospital care per year; 3) frequency of admission (discharge), i.e., the number of admissions of the individual patient during a given time period; 4) surgery (presence or absence, number of operative interventions, number of operations, nature and type of operation); 5) ancillary services (presence or absence, number, com-

plexity, and dollar volumes of charges per service and of total charges); 6) total hospital bill; and 7) total accommodation charges.

In addition to the factors of age, sex, marital status, race, income, resources, occupation, education, insurance coverage and diagnosis, the authors suggested a typology of correlates relevant to the attending physician and the environment.

Characteristics of the attending physician would include school of practice, specialty, specialty board status, and length of time in practice.

Environmental characteristics would include hospital (size, scope of services, ownership, type - general, special, chronic, occupancy, accreditation status, teaching or nonteaching); medical staff (M.D. or D.O. organization, ratio of specialists to total staff, ratio of physicians on staff to beds in hospital); area of residence (region of state, bed-population ratio, physician-population ratio, urban-rural character, per capita income, and distance from residence to hospital); financial aspects (size of hospital bill, source of payment of bill, the patient's participation in payment of bill, the patient's resources, other claims on the patient's resources, and adequacy of prepayment or insurance coverage); and time factors (month of year admitted and discharged and day of week admitted and discharged).

A cross-tabulation of percentage distributions and multivariate analysis were employed to analyze the Michigan data.

Though this overview is an excellent summary of many possible measures and correlates of use, only a few selected findings will be pointed out here.

The authors concluded that patients use hospitals in many different ways. These differences are natural and normal insofar as they are created by differences in need among the patients themselves. The diagnosis of the patient's illness or condition is the most important single characteristic.

Age and sex and the inter-relationships between need, age and sex are also important. Hospital use varies greatly according to their influence, for many diagnoses are age- or sex-specific. The group of patients who use the hospital most is the group 65 and older. This group has the greatest need for hospital services and the least prepayment and insurance protection.

57. Franklin, B. J. and S. D. McLemore, 1970. "Factors affecting the choice of medical care among university students." *J. Health Soc. Behav.* (December): 311-319.

The purpose of this study was to formulate a social-psychological model of factors predicting an individual's decision to seek professional medical care.

The population for the study was a 1 percent stratified random sample of the student population of a large state university in the Southwest during the fall semester of 1966. A questionnaire mailed to these students yielded a response rate of 192 out of 266. These questionnaires and the Student Health Center records provided the data.

An index of the proportion of total professional medical services that a student sought at the Student Health Center was constructed:

the number of times the student utilized the services of the SHC during a given period of time as recorded on his health record =  $T_s$

the number of times the same student reported having utilized the services of a private physician during the same period =  $T_p$

the mean population of the total professional medical services that students secured at the SHC =  $\frac{T_s}{T_s + T_p}$

A predictive model for health care seeking was constructed by combining the following dichotomous predictor variables:

*I+ or I-*

a student whose behavior is relatively independent of or dependent on the attitudes of students with whom he interacts

*O+ or O-*

a student who perceives the attitudes of others toward the SHC as favorable or unfavorable

*A+ or A-*

a student whose own attitude toward the SHC is favorable or unfavorable

*C+ or C-*

a student who possesses a high or low ability to pay for services of a private physician

A difference of means test of significance was employed to test the model.

In general the findings provided support for the general predictions flowing from the model.

58. Freeman, H. E. and C. Lambert, Jr., 1965. "Preventive dental behavior of urban mothers." *J. Health Hum. Behav.* 6 (Fall): 141-147.

This study assessed the impact of the preventive dental behavior of urban mothers and related socio-economic and attitudinal variables on children's preventive dental care.

Household interviews with the mothers of 265 families with one or more children between the ages of 5 and 8 in one-half of the census tracts in Brookline, Massachusetts, provided the data.

Four utilization indices were used to gauge children's use of dentist services: received only a checkup from a private dentist during the past year; received treatment from a private dentist during the past year; attended the public dental clinic or one of the local teaching

institution clinics during the past year, and had not received treatment for over a year.

Three groups of mothers were formed according to their preventive dental behavior, family income and the mother's education. The mothers' groups were identified as follows: mothers examined by a dentist within the past year who did not require treatment; mothers who received dental treatment within the past year or who had a dental exam within 1 to 2 years prior to the interview but who did not require treatment; and mothers who had not seen a dentist for either treatment or diagnosis during the past two years.

A Chi-square test of significance was performed on the data.

There is a strong positive relationship between the mother's own dental behavior and the care of the child's teeth. Mothers whose behavior for themselves is preventive-oriented are 9 times more likely to use private dentists for preventive checkups for their children than mothers who received no treatment in the past two years.

There is a statistically significant positive relationship between family income and the extent to which mothers engage in preventive dental behavior. The relationship between preventive practices for children and income was less clear, as was the relationship of the mother's education to both her dental behavior and that of her child.

59. Freeman, H. E., et al., 1966. "Use of medical resources by SPANCOS: I. extent and sources of medical care in a very old population." *Amer. J. Pub. Health* 56 (September): 1530-1539.

This study assessed the utilization experience of a group for whom the financial barriers to receiving medical care had been removed.

Interviews with a sample of 18,564 living veterans of the Spanish-American War, the Boxer Rebellion and the Phillipine Insurrection (SPANCOS) who may receive virtually all their care free from the V.A. and who were residing in the United States on February 1, 1964 provided the data.

The utilization indices were the proportion of the sample, number of times and number of days these people were hospitalized in a year; the frequency of medical contacts or three or more days in bed; and the source of care (V.A. only, V.A. and non-V.A., and non-V.A.).

The correlates were age, number of medical symptoms and self-ratings of health.

A Chi-square test of significance was performed on the data.

There were higher rates of utilization for this population than for those persons 65 and over in the general population. The V.A. hospitals were used most by those requiring long term hospitalization and provided the

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bulk of the ambulatory care involving several visits to the physician per year

Patients with the greatest number of reported symptoms or poor self-ratings of health were more likely to receive care exclusively from the V.A. than solely from community resources.

The authors discuss the implications of these findings for providing free medical care to an aged population.

60. Gaspard, N. J. and E. E. Hopkins, 1967. "Determinants of use of ambulatory medical services by an aged population." *Inquiry* 4 (March): 28-36.

This study tested the hypothesis that when medical care is freely accessible, the amount of services consumed is determined by the objective physical condition.

Clinic records, symptom check lists, personal interviews, and physical exams of 343 persons 65-69 years of age who were part of the USPHS Heart Disease Control Program in a condominium retirement village in California provided the data.

The utilization indices were the numbers of physician, nurse and physical therapy visits and hospitalized days during a baseline year, July, 1963-June, 1964. This measure was divided into low, middle-range and high use categories.

Each of the data collection mechanisms yielded a variety of variables which may be related to use, such as physiological, emotional and sociological aspects. Seventy-nine variables were selected and their correlation with utilization assessed.

A stepwise regression analysis was used to analyze the data.

The level of use was found to be most directly associated with objective, largely chronic, disease in the population and not significantly related to social-psychological factors such as loneliness, hypochondria and anxiety.

Generally, the number of diagnosed conditions a person had was the most important determinant of level of use. Among the highest users, chronic illness such as secondary anemia and liver disease were the best predictors. Among the low users, unmet medical needs were reflected in their anxiety, low self-estimates of health status and other such social-psychological attitudes.

No evidence of high demands not associated with objective illness was found. The main hypothesis being examined was confirmed.

61. Glasser, M. A., 1958. "Study of the public's acceptance of the Salk vaccine program." *Amer. J. Pub. Health* 48 (February): 141-146.

This study appraised the factors influencing people's acceptance or non-acceptance of the Salk vaccine.

Interviews as part of a nationwide survey of 3,509 adults in January, 1957 provided the data.

The utilization index was participation in the vaccine trial.

The correlates were past health behavior, socio-economic status, and the method of communication about the trials.

A cross-tabulation of percentage distributions was used to analyze the data.

Those already vaccinated were the most vocal supporters for further vaccinations. The lower socio-economic groups were less likely to be vaccinated than higher socio-economic groups. Informal communication was the most effective means of influencing people to take the vaccine.

62. Goodrich, C. H., et al., 1965. "A progress report on an experiment in welfare medical care." *Amer. J. Pub. Health* 55 (January): 88-93.

This study described the progress and problems of the New York Hospital-Cornell Welfare Project.

Clinical and administrative records of the first 500 cases to receive care in the first year (1962-63) of the five-year study of the Project provided the data.

The utilization indices were the percent of those receiving care who were hospitalized; the average number of days per person hospitalized; and visits per person by the type of visit (out-patient department doctor, out-patient department non-doctor, emergency room, home visit).

The correlates were membership in the New York-Cornell Welfare Project or in a control group receiving regular hospital care.

A cross-tabulation of percentage distributions was used to analyze the data.

In general, adults in the welfare study group were usually sick when they used the service and consequently used a large number of services. Children were relatively healthy and used fewer services.

The percent of the welfare group hospitalized was much higher than the rate of the regular medical clinic patients in the New York Hospital. The average length of stay was about the same as that for the regular ward patient. The total number of visits per person, however, was much higher probably due to diseases discovered upon initiation of clinic contact.

See also reference number 63.

63. Goodrich, C. H., et al., 1970. *Welfare Medical Care*. Cambridge: Harvard University Press.

This book is a report on an experiment in welfare medical care that was conducted in New York City in which welfare recipients were divided into three groups: Group A received medical care through city hospital outpatient service appointments; Group B also received care through city hospitals, but there was no special attempt to establish outpatient services as the regular source of care; Group C continued to obtain care as provided to welfare patients using multiple facilities in the city (control group).

Medical care utilization was indeed increased for the welfare recipients by using the coordinative mechanisms of Group A. A sharp decrease in the use of services by both the study and control groups were noted in the second year, however, presumably resulting from a change in health status.

There appeared to be little difference in the cost of services for the two New York City hospital groups, though the control group costs were approximately two-thirds that of the other two. There appears to be no objective improvement in the health status of the study groups over the control groups.

The group that received New York City hospital care did report more satisfaction than the control groups.

See also reference number 62.

64. Gornick, M. E., et al., 1969. "Use of medical services as demanded by the urban poor." Amer. J. Pub. Health 59 (August): 1302-1311.

This study assessed the effects of the Medical Assistance Program on a low-income group's utilization of services in Baltimore.

Household interviews from a cluster sample of 1000 households in economically-deprived census tracts in Baltimore in March, 1967 provided the data.

Site of the visit (clinic or private physician) and the percent who saw a physician during the past two weeks were the utilization indices.

This study compared the enrollment in the new Medical Assistance Program with the enrollment in the old Baltimore City Medical Care Program. MAP is primarily a financing mechanism; the old city program had seven hospital-based clinics providing services and directing patients to neighborhood physicians.

Graphs, cross-tabulation of percentage distributions and an unspecified test of significance were employed to analyze the data.

During the last year of the old Baltimore City Medical Care Program 58 percent of the visits were made to private physicians and 42 percent to the clinics.

The survey data revealed that, after introduction of the MAP, 41 percent of the visits were to physicians and the balance to clinics. This shift is explained by the absence of clinics referring patients to area physicians and by the broadening of the eligibility requirements in the new program which resulted in even heavier concentrations of eligibles in areas of physician scarcity.

The proportion of individuals on MAP who visited a physician two weeks prior to the interview was significantly higher than those who were not on MAP. Age and sex-specific rates revealed a similar trend.

65. Graham, S., 1957. "Socioeconomic status, illness, and use of medical services." Milbank Mem. Fund. Quart. 36 (January). 58-66.

This study examined the relationship of socioeconomic status and illness to the use of physicians and hospitals in Butler County, Pennsylvania.

Interviews with an area probability sample of 3,403 whites in Butler County in 1954 provided the data.

Utilization indices included the age-adjusted percentage of persons who 1) consulted a physician for any reason in the month prior to the survey, 2) consulted a physician for a general physical exam, or 3) were hospitalized in the past year.

The respondents' socio-economic status was based on Edward's occupational categories.

A cross-tabulation of percentage distributions was used to analyze the data.

There appeared to be only infinitesimal differences among the different social classes in regard to the use of physician services.

66. Gray, R. M., et al., 1966. "The effects of social class and friends' expectations on oral polio vaccination participation." Amer. J. Pub. Health 56 (December): 2028-2032.

This study explained further the relationship of social class to participation in polio vaccine trials.

Interviews with a state-wide sample of mothers with children under five years of age provided the data.

The utilization index was participation in the polio vaccine trials.

The correlates examined were social class and the mother's belief about whether her friends expected her to have her child immunized.

A Chi-square test of significance was employed to analyze the data.

Mothers from the lower social classes had their children immunized less frequently than those from the middle or upper classes. Lower class mothers less frequently reported that their friends expected them to utilize available immunization services to protect their children against polio.

No significant differences were found to exist among the different social classes when the mothers with similar views concerning their friends' expectations were considered separately.

The authors suggest that this friendship factor should be considered in interpreting the relationship between social class and participation in polio vaccine trials.

67. Greenlick, M. R. and D. K. Freeborn, 1971. "Determinants of medical care utilization: on choosing the

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appropriate measure of utilization." Paper presented at the Engineering Foundation Conference on "Quantitative Decision Making for the Delivery of Ambulatory Care." Henniker, New Hampshire (July, 1971).

This paper was a summary of the diverse indices of utilization of medical services found in the Kaiser Foundation Health Plan literature.

Most of the articles examined were based on studies of the Kaiser Plan by the Health Services Research Center. Data were collected from medical and administrative records and interviews.

The authors pointed out six main classifications of the use variables: cost of services; use of total medical services by place of service (clinic, home, emergency room, telephone or letter); use of a particular service such as a physician office visit; use or non-use; use for an episode of disease; and failure to arrive for an appointment.

This article summarized the multiplicity of indices of utilization and encouraged "a careful matching of the questions asked in the research and dependent variables used to answer these questions."

The authors indicated that the cost of services was a relevant utilization index for assessing the efficiency of various health delivery systems, but not for reflecting inter-individual or inter-family utilization differences.

Use of total services was a useful measurement for examining total utilization patterns of a population but the authors noted that care must be taken not to obscure meaningful qualitative differences.

The use of a particular service was an important measurement for refining a dependent variable but medical records in which this information is found are often not the most accurate data source.

Measurements of use and non-use were an important evaluation too, in appraising the characteristics of people who do or do not make use of a particular medical care program.

Response to an episode of disease was important for understanding the characteristics of individuals and the initiation of contact with the medical care system for an episode of illness.

The failure to arrive for an appointment proved useful for evaluating differential accessibility to the medical care system.

The authors also emphasized that increasing attention should be given to the family as the unit of observation for studying utilization.

68. Greenlick, M. R., et al., 1970. "Comparing the use of medical care services by a medically indigent and a general membership population in a comprehensive prepaid group practice program." Paper presented at the

meeting of the American Public Health Association (October, 1970).

This paper compared the utilization of medical care services by the general membership of a prepaid group practice plan with that of the participants in an OEO comprehensive neighborhood health center program also enrolled in the plan.

Medical and administrative records of a five percent sample of the Kaiser Foundation Health Plan and the membership of Kaiser's OEO Health Center Program provided the data.

There were four utilization indices: the proportion from each group who used at least one medical service in a given year; total medical care services used in a given year; doctor office visits per 100 persons per year; and the proportion who did not appear for regularly scheduled appointments.

Total services was further defined by seven sub-categories: type of service (physician, physical therapist, nurse, mental health specialist, social worker, optometrist, audiometrist); time of service (during or after clinic hours); type of appointment (regularly scheduled, walk-in, emergency room, telephone or letter), duration of symptoms; physician status (regular or temporarily attending physician); status of diagnosis (unknown, tentative, established); and presenting morbidity.

These use patterns were examined for both the regular Kaiser Plan membership and OEO enrollees by age, sex and morbidity status.

A cross-tabulation of percentage distributions was used to analyze the data.

Approximately 77 percent of each group received at least one service during the year. This proportion generally increased with age and decreased with family size.

Overall utilization patterns of total medical care services were similar for both groups, though the OEO population tended to show a greater use of services outside clinic hours and use of non-scheduled services. These differences could not be explained by delay in reporting symptoms, as the OEO population tended to delay least. Nor could these differences be explained by status of diagnosis or overall morbidity which appeared similar in both populations.

Members 19 and over in the OEO population used considerably more doctor office visits than did similar people in the health plan.

The OEO population also used from 20-100 percent more walk-in visits than the regular membership. Men 19-44 and 54-64 in the OEO population tended to use physician services more for chronic diseases, injuries and diseases with a high emotional component than did regular membership men over 19.

The no-show rate for the OEO population was markedly higher.

The similarities of the two populations may be more striking than the differences, however, especially for those under 19 and for the proportion who received at least one service during the year.

69. Greenlick, M. R., et al., 1968. "Determinants of medical care utilization." *Health Services Research* 3 (Winter): 296-315.

The authors proposed a multidimensional framework for analyzing medical care utilization which posited that different sets of background characteristics (independent variables) are significant determinants of utilization (dependent variable) in different disease situations (intervening variable).

The registration records and medical care records of a five percent sample of the Kaiser Foundation Health Plan membership and the Portland, Oregon, city directory provided the data.

There were four utilization indices proposed: place of service; department of physician ordering and rendering services; primary type of service; and status of physician ordering and rendering services.

Place included clinic, home, nursing home, emergency room, telephone or letter and Kaiser inpatient or extended care facility. The physician's department may have been internal medicine, OB-GYN, ophthalmology, orthopedics, pediatrics, surgery, urology and ENT. Type of service included physician, physical therapy, nurse, mental health and optometry. Status of the physician meant he was either the regular or a temporary attending consultant.

Background characteristics included such things as age, sex, race, religion, marital status, employment status and occupation. The authors proposed a household survey to gather other basic demographic, social economic, situational and attitudinal data from the sampled population.

This article is the rationale and summation of the methodology for potentially analyzing this model of medical care utilization.

70. Harmon, E. L., 1968. "Third-party payment increases utilization of home care services." *Hospitals* 42 (September 1): 68-72.

This article assessed the impact of third-party payors on the increased use of home-care services.

The administrative records of enrollees in various third-party payor programs provided the data.

Home-care services (such as visiting nurses) were the main kind of use examined here.

The correlates included the third-party payors: welfare agencies, Medicare (Titles 18 and 19), commercial insurance carriers and Blue Cross.

The author summarized various programs and expenditures for home-care services.

There is evidence for the increasing availability of, and expenditures for, home-care services since the introduction of third-party payment mechanisms to cover such services.

71. Hurtado, A. B., et al., 1969. "The organization and utilization of home-care and extended-care facility as a pre-paid comprehensive group practice plan." *Med. Care* 7 (January-February): 30-40.

This study described the organization and utilization of extended-care and home-care services.

Records of the membership of the Kaiser Foundation Health Plan provided the data.

The number of admissions and the average length of stay comprised the utilization indices.

A cross-tabulation of percentage distributions was used to analyze the data.

Internal medicine referrals accounted for the largest number of admissions to the extended-care facilities and the largest number of home-care services. Different morbidities resulted in different patterns of use and length of stay in each of the services.

72. Jehlik, P. J. and R. L. McNamara, 1952. "The relation of distance to the differential use of certain health personnel and facilities and the extent of bad illness." *Rural Sociology* 17 (September): 261-265.

This study analyzed the relationship between distance of a health facility from a family and family members' use of this health resource.

Interviews from a survey of 858 households of the farm population in specified counties in Missouri provided the data.

The utilization indices were physician visits per 1000 persons and physician visits per 1000 days of bed illness.

Distance was measured to the nearest mile and following the most direct route from the survey residence to the nearest physician and hospital.

A cross-tabulation of percentage distributions was used to analyze the data.

The authors found that people who live at greater distances from facilities tend to have lower physician visit rates.

73. Joseph, H., 1971. "Empirical research on the demand for health care." *Inquiry* 86 (March): 61-71.

This paper reviewed the empirical research on the demand for health care.

This article has a three-fold purpose: to summarize the important determinants of the demand for care; to review critically nine empirical studies on the demand for health services; and to summarize the important results of these studies and suggest further research.

The author lists the four primary determinants of demand as price, the price of substitutes or complements, income and taste.

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A number of studies were reviewed. M. S. Feldstein, P. J. Feldstein, H. Joseph, S. G. Long, and others.

Relative to each of the determinants of demand, the findings reviewed indicated that:

Price appeared to explain a relatively small amount of the variation in the demand for care, except perhaps where free care was available.

Health care expenditures increased as consumer income increased though income elasticity was usually less than 1.0. An exception was the elasticity for dental expenditures which people may consider elective, unless income is sufficiently high, people may not purchase dental care.

The age of the patient appeared to be related to use though other taste variables such as sex, rural versus urban residence, marital status and education were not exclusively reviewed.

As price and income are some of the economic variables that are most directly affected by changes in public policy, the author concluded that the responsiveness of the demand for health care to changes in these variables should be refined.

74. Josephson, C., 1966. "Family expenditure patterns of federal employees for covered items of health care services." *Inquiry* 3 (February): 40-54.

This study assessed family expenditure patterns of federal employees with respect to the age, sex, benefit level and employment status of the family-head enrollee.

The claims records of the master-status file for members enrolled under the Federal Employees Health Benefits Program's Government-wide Service-Benefit Plan (Blue Cross-Blue Shield) during the fourth period with the Civil Service Commission provided the data.

The utilization index was the average annual expenditures, including hospital and physician services, for covered items of service.

The correlates examined included age, sex, benefit level and employment status of the family head.

A cross-tabulation of percentage distributions was used to analyze the data.

Findings revealed that as the age of the family increased, the total family expenditures for health care services increased. Annual expenditures for families enrolled under male employees exceeded those for females. Families with high option benefits spent more than those with low option benefits. Family expenditures for annuitant families exceeded those for employed families.

75. Kasl, S. and S. Cobb, 1966. "Health behavior, illness behavior and sick-role behavior." *Arch. Environ. Health* 12 (February): 245-266.

This often-cited article describes factors that influence an individual's seeking of medical care in terms of health, illness and sick-role behavior.

The authors noted the following six stages in the progress of a disease: health of a patient, an asymptomatic disease susceptible to detection, a symptomatic disease not yet diagnosed; a manifest disease at the time of diagnosis; the course of the disease as influenced by treatment; and the disease after therapy.

Three behaviors related to health and illness include health behavior, that is, activities undertaken to prevent illness in the asymptomatic stage, illness behavior, that is, activities undertaken to discover a remedy or define the state of health when a person feels ill, and sick-role activities, that is, activities undertaken to get well and receive treatment for a perceived illness.

The likelihood that a person will engage in a particular behavior is influenced by two variables: perceived amount of threat and perceived attractiveness of the behavior. The perceived amount of threat is influenced by the importance of health matters to an individual, his perceived susceptibility and the perceived seriousness of the illness. Perceived attractiveness of the behavior is influenced by perceived possibility of ameliorative outcomes and cost or unpleasant outcomes likely from the action.

The authors criticized utilization studies for:

- 1) their failure to control for health status;
- 2) their absence of interest in social-psychological variables;
- 3) their omission of the aspects of illness behavior, self-medication and use of nonmedical functionaries; and
- 4) (for the purpose of the authors' scheme) the fact that utilization of health services could be viewed as either illness behavior or sick-role behavior — or, for that matter, health behavior.

76. Kegeles, S. S., 1963. "Some motives for seeking preventive dental care." *J. Amer. Dent. Assoc.* 67 (July): 91-98.

This article presents a model to explain people's seeking of dental care.

Interviews with a stratified sample of Endicott-Johnson Corporation employees who were eligible for dental care under a company-financed plan provided the data.

The utilization index was the percent of individuals who made preventively-oriented dental visits.

The correlates were perceived susceptibility, perceived seriousness of a dental problem, and perceived likelihood of benefit from seeking the service.

A Chi-square test of significance and Fisher's exact test were employed to analyze the data.

Almost two-thirds of the respondents who believed themselves susceptible to dental problems made dental visits. One-half of those who believed themselves less susceptible made such visits.

Similar proportions were in evidence for those who perceived that a resultant dental problem would be serious compared with those who did not.

A similar relationship was also found for those who perceived they could receive positive benefits from such a visit versus those who did not.

The author concluded that his model would be useful for explaining people's utilization of dental services.

See also reference number 77.

77. Kegeles, S. S., 1961. "Why people seek dental care: a review of present knowledge." *Amer. J. Pub. Health* 51 (September): 1306-1311.

The author reviewed survey findings regarding the population's utilization of dental services and posited a readiness-for-action model which suggested an individual would seek dentist services if he perceived:

- 1) that he is susceptible to dental problems;
- 2) that, should he become afflicted, it is likely to result in serious consequences to him;
- 3) that his need to take action is more important than a variety of other things; and
- 4) that the actions taken will be beneficial to him.

See also reference number 76.

78. Kegeles, S. S., 1963. "Why people seek dental care: a test of conceptual formulation." *J. Health Hum. Behav.* 4 (Fall): 166-173.

This article examines the predictive utility of selected social-psychological factors on whether a random sample of factory employees had preventive dentist visits over a three-year period.

The author re-surveyed a group of 426 factory employees on whom a retrospective study of dental use had been conducted three years earlier through open-ended interviews. A control group of 455 employees of the same company was part of both studies.

Date for the second study were collected by questionnaires mailed to both groups with an 81 percent response.

The utilization index was the percent of each group who made preventively-oriented dental visits during the past three years.

The correlates were perceived susceptibility, perceived seriousness of the dental problem, fear of pain and anxiety about dental treatment, education and socio-economic status.

A Chi-square test of significance was performed on the data.

Persons who believed they were more susceptible to dental problems were more likely to make dental visits. Perceived seriousness was not found to be statistically related, however. Despite statistical significance, the percentage differences in use among those who expressed fear of pain or anxiety and their counterparts were not large.

The best predictor of dental use was past behavior. Almost all of those who made dental visits in the previous survey were also found to have made visits in the re-survey.

79. Kessel, N. and M. Shepard, 1965. "The health and attitudes of people who seldom consult a doctor." *Med. Care* 3 (January-March): 6-10.

This was a study of the characteristics of persons who had not consulted a physician for a long period of time.

Home interviews with patients who were continuously registered in the general practice of Dr. John Fry, British National Health Service, during the first ten years of the National Health Service 1949-1958, provided the data.

Utilization was determined for recent attendees and one-year, two-year and ten-year non-attendees. Recent attendees were subjects who had consulted with the physician within the past year. The non-attendees were subjects who had not consulted the physician in the specified time periods.

Social factors (age, sex, lived at home or not, away during the survey period, social class, employment status and size of the household); illness experience (such as a serious illness); mental health history; other medical or para-medical services used; self-medication; and health attitudes were determined for the sample of patients.

A cross-tabulation of frequency distributions was used to analyze the data.

The authors found that non-attendees were more often men than women and were as frequently old as young. They showed no difference in social class, employment status or size of household. Very few lived away from home or had been away during the survey period.

Though the non-attendees possibly had less serious illness in the past, they had the same amount of recent trivial illness, but less emotional disturbance than recent attendees.

The non-attendees did not obtain medical care elsewhere nor did they employ paramedical services or self-medication more than the recent attendees. In general, they took a favorable view of their health status and considered themselves healthy.

80. Kisch, A. I. and J. W. Kovner, 1969. "The relationship between health status and utilization of outpatient health services." *Arch. Environ. Health* 18 (May): 820-833.

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This study assessed the effectiveness of health status as a predictor of utilization of outpatient health services for two medical care plans.

Data for the study came from two sources: 1) interviews with 500 longshoremen and their dependents in Stockton, California, covered by the San Joaquin Foundation for Medical Care and 2) the medical records of a randomly selected, size-matched study group comprised of employees of the Department of Water and Power in Los Angeles and their dependents, covered by the Ross-Loos Medical Group.

The utilization measure for ambulatory care was based on five broad categories of use. The five categories were office visits; laboratory services such as blood counts and blood chemistry; minor surgical services (initial or follow-up visit); radiological services; and all other services.

Office visits included initial office visit and follow-up visit for an acute or chronic illness; initial office visit and follow-up for a severe or mild accidental injury; physical exam for a child or an adult, with or without presenting illness; telephone consultation or visit with the nurse only; and a visit for inoculation or immunization.

A proxy measure for health status was constructed. It was based on a patient's ability to recall having had the following ailments during the previous 12 months: 1) for a chronic illness, continuous use of medicine for one month or more and the number of chronic conditions (from a checklist) which the respondent then had or had had; and 2) for an acute illness the non-obstetrical days spent in the hospital and the number of episodes of acute illness (from a checklist) experienced by the respondent in the period of recall.

A Chi-square test of significance and regression analysis (to test the validity of the proxy measure of health status) were used to analyze the data.

Utilization of 13 of the 19 services was found to be significantly associated with health status. For the six services for which there was no significant association between the health score (HSCORE) and utilization (UTIL), two involved office visits in connection with accidental injury, three involved office visits for various types of physical exams, and one was a case in which only a nurse was seen.

Each of these instances, however, was likely to involve healthy persons. The trend to lesser utilization by healthier persons found for most other services would, therefore, not be observed here. For nine categories, the association between HSCORE and UTIL was found in both the study populations. This association was due in large measure to agreement between good health and non-utilization of services.

The authors pointed out that "persons with increasing intensity of illness tended to decrease their non-use

of services." Therefore, health status may be considered more appropriately as a good predictor of non-utilization than as a predictor of utilization.

There appeared to be no difference between the two health plans in the proportion of ambulatory health care services received by individuals with varying intensities of illness.

81. Klarman, H. E., 1963. "Effect of prepaid group practice on hospital use." *Pub. Health Rep.* 77 (November): 955-965.

This study summarized many of the major findings regarding the relationship of prepaid group practice plans to hospital use.

Data come from the following household surveys and studies of matched populations. HIF-NORC (1953); HIP (1951); Windsor Medical Services (1954). HIF-NORC (1958); six studies of matched populations. HIP (Blue Cross) (1955), HIF-NORC (household survey) (1957). HIP (Blue Cross) (1957); steelworkers insurance plans (1958); HIP (district 65) (1958); Columbia University (household survey) (1958); HIP (1962); Columbia University (1962).

The utilization indices included the admission rate per 1000, the average length of stay in days and the number of patient-days per 1000.

Utilization rates in the prepaid group insurance plans such as HIP and Kaiser Foundation Health Plan were compared with the solo fee-for-service plans that Blue Cross and commercial carriers support.

HIP and other prepaid group practice plans reported low hospital use by members, lower than Blue Shield and Group Health Association but not lower than that of the self-insured members of the District 65 Department Store Union.

Another prepaid group practice plan, the Kaiser Foundation Health Plan, reported low use for its subscribers. A comparison of steelworkers insured under Blue Cross-Blue Shield, commercial insurance and the Kaiser Plan showed the lowest hospital use under the Kaiser Plan. However, a Columbia University study of machinists and members of similar unions found no difference in hospital use among subscribers to the Kaiser Plan and two other comprehensive health insurance plans, Blue Cross-Blue Shield of New Jersey and General Electric major medical. The latter two provided medical services through private practitioners on a fee-for-service basis.

This last finding is contrary to the experience in Canada where fee-for-service payment to physicians was associated with higher rates of hospital use than physician payment by salary or capitation.

The two 1962 studies by HIP and Columbia University further failed to confirm the findings from previous studies that subscribers to prepaid group practice plans have lower hospital use than subscribers to other plans.

82. Klem, M. C., 1965. "Physician services received in an urban community in relation to health insurance coverage." Amer. J. Pub. Health 55 (November): 1699-1716.

This study assessed the impact of health insurance coverage and related factors on the utilization of physician services.

Interviews with a probability sample of 5,344 persons from 2,216 families in the Washington Heights Health District, New York, provided the data.

The utilization indices were the percent of the sample receiving physician care during the study year and the type of first physician consulted (family physician or other in private practice, out-patient department physician, or New York City Health Department physician).

Information was collected on age, family income, type of insurance carrier (no insurance, Blue Cross, Blue Shield, or commercial insurance), type of service covered by health insurance, and the event precipitating need for care (illness, accident or preventive care).

Cross-tabulation of percentage distributions was used to analyze the data.

Three out of four persons had some type of health insurance. Blue Cross and Blue Shield were the most popular type. Family income was directly related to having insurance coverage. Coverage of the aged was low in each income class, but the aged poor had the least coverage of any group.

About half of the population received service from a physician at least once during the year. Within each income category, those persons with insurance coverage were more likely to receive services than were persons with no coverage. Persons with fairly complete coverage were more apt to see a physician than those with less extensive coverage. Compared to other age groupings, relatively more of those 65 and over with comprehensive coverage consult a physician during the year.

In 69 percent of illness cases, the patient went to a physician in private practice. For all cases, 73 percent of the persons with health insurance first consult a physician in private practice as compared with 56 percent of those with no insurance.

83. Koos, E. L., 1954. *The Health of Regionville*. New York: Columbia University Press.

This book describes the varying health attitudes and behaviors of different social classes in a typical small town in upstate New York.

Interviews with 550 household heads in Regionville (a pseudonym for an upstate New York community) provided the data.

The utilization indices were use of physicians and whether or not the respondent had a family doctor, and use of druggists and chiropractors.

Three different social classes were defined. Class I family heads were business or professional men with a modal income of over \$4000. Class II family heads were skilled or semi-skilled workers with an average income of \$2374 and farmers with an average income of \$2722. Class III family heads were laborers, both village and rural, with an average income of \$1700.

Cross-tabulation of percentage distributions was employed to analyze the data.

Koos found that in Class I, 82 percent reported having a family doctor; only 10 percent had changed doctors since the household was established. In Class II, 73 percent had a family doctor and only 16 percent had changed doctors since the household was established. But in Class III only 32 percent had a family doctor and 63 percent had changed doctors.

Class III also sought medical advice from the druggist much more often than Class I or Class II respondents.

And 58 percent of Class III families were prepared to use a chiropractor compared with two percent of Class I.

Class I was much more favorable toward group as opposed to solo practice than Class III.

In addition, Koos reported that Class I had the greatest symptom sensitivity while Class III had the most chronic illness.

84. Kovner, J. W., 1969. "Measurement of outpatient office visit services." Health Services Research 4 (Summer): 112-127.

This article describes the identifiable medical procedure (IMP) system for measuring office visit services. The number of IMP units assigned for an office visit is a function of the training and type of personnel providing the services as well as the health status of the individual.

85. Kovner, J. W., et al., 1969. "Income and the use of outpatient medical care by the insured." Inquiry 6 (June): 27-34.

This study attempted to determine the differential impact of two insurance plans on utilization of health services.

Interviews with medical records of samples of the two insurance plans' membership provided the data. The first group was composed of a sample of 500 longshoremen and their dependents in Stockton, California, covered by the San Joaquin Foundation for Medical Care. The second group was a selected size-matched study group composed of employees of the Department of Water and Power in Los Angeles and their dependents covered by the Ross-Loos Medical Group.

Utilization indices included office visits, laboratory, minor surgical, radiological and all other services.

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Per capita income and use were examined for each sample.

Correlation coefficients and income elasticities were used to analyze the data.

When an insured population utilized insured outpatient services, an independent relationship existed between use and income and the income elasticities for outpatient health services approached zero (that is, changes in income have no effect on consumption). This finding applied in both plans.

For uninsured outpatient services, the population at the San Joaquin Foundation exhibited an independent relationship between income and use, with elasticities approaching zero. For the Ross-Loos population, income and use are dependent for three out of the four categories of insured services, with elasticities of over 0.7 each.

The author suggested that the reason for the independent relationship for uninsured services in San Joaquin is that under that plan one must use these services in order to obtain the valued insured services, for which the income elasticity is zero.

86. Kriesberg, L., 1963. "The relationship between socio-economic rank and behavior." *Soc. Prob.* 10 (Spring): 334-352.

This study attempted to separate the cultural and situation-specific determinants of socio-economic differences in health services utilization.

Hospital admission rates per 100 persons, physician office visits per person in specified time period, and the percentage of persons visiting a dentist within the preceding 12 months were reported.

The relationship of cultural factors (that is, parental transmission of generalized values and beliefs) and situational factors, both social (such as patterns of interaction) and non-social (such as income) to these various kinds of use were described.

A tabular presentation of rates and percentages was used to display the data.

Kriesberg emphasized the necessity for refining the specific situational determinants of health utilization behavior and disavowed the importance of some generalized cultural and attitudinal explanations.

He showed that hospital admission rates for the different income classes have tended to equalize over the past few decades. Kriesberg cited several possible situational determinants, including the rise of voluntary insurance, a general rise in real income, greater sick leave and retirement benefits, improved transportation and availability of facilities, and increased use of hospitals by physicians.

Physician office visits per person have tended to equalize among the different social classes. Here again the effect of insurance as a situation-specific determinant is cited in an example from HIP of New York.

There is still a strong relationship between socio-economic rank and dental utilization, however. The author emphasizes that situation-specific variables such as income and parental seeking of preventive care, rather than some global attitudes toward dental care, primarily explain this continuing difference.

87. Kriesberg, L. and B. R. Treiman, 1962. "Preventive utilization of dentists' services among teenagers." *J. Amer. Coll. Dent.* 29 (March) 28-45.

This study examined the impact of selected factors on teenagers' use of preventive dental services.

Data came from household interviews with a national sample of teenagers during a dental survey conducted by NORC in 1959.

The utilization index was a measure based on three conditions: that the teenager sometimes had a dental checkup, went to the dentist at least once a year and actually had been to the dentist within the past 12 months.

The correlates were general teenage and parental orientation, information, values and beliefs; school dental experience; characteristics of dentists; fear of pain, childhood training and family experience; and financial resources.

A cross-tabulation of percentage distributions was used to analyze the data.

For the teenagers, the first correlate did not seem to influence their preventive use of dental services, though the importance of parental values and orientation was suggested by the findings.

The variables of having a dental exam at school and not fearing a visit to the dentist were found to be related to use. Evidence indicates that the dentist can greatly affect the extent to which patients continue to visit him on a regular preventive basis.

Parental beliefs and practices about actually going to the dentist early and regularly were very important as predictors of children's use. This finding was more important than that for any generalized attitudes about dental care.

The striking relationship of financial resources to use underscores again the higher dental utilization by higher income groups.

88. Kriesberg, L. and B. R. Treiman, 1960. "Socio-economic status and the utilization of dentists' services." *J. Amer. Coll. Dent.* 27 (September): 147-165.

This study examined the impact of selected socio-economic factors on adults' use of dental services.

Household interviews with a national sample of adults during a dental survey conducted by NORC in 1959 provided the data.

The utilization indices were preventive users and non-users who must have fulfilled three conditions. The users sometimes had a dental checkup, went to the dentist at least once a year and had actually seen the dentist at least once within the past 12 months. The non-users felt they should have had dental care and believed that if they went to the dentist they would need a lot of work, but had not actually seen a dentist within the last year.

The correlates were income, education, general orientation, childhood training, values and beliefs about teeth, characteristics of dentists and fear of pain.

A cross-tabulation of percentage distributions was used to analyze the data.

Constraints such as lack of money seemed particularly important for not going to the dentist when dental work was needed. Childhood training, ideas about teeth and their care, and the characteristics of the dentist seemed particularly important for preventive care.

Early childhood training and the characteristics of dentists were more important than general orientations for all types of dental care. These factors are of importance in determining whether dental care is actually sought when needed as well as for preventive care.

Further work needs to be done in order to understand the precise effect of the inter-relationships of these variables.

89. Lavenhar, M. A., et al., 1968. "Social class and medical care indices of non-urgency in use of hospital emergency services." *Med. Care* 6 (September-October): 368-380.

This study examined the relationship of socio-economic status to use of the emergency room.

Interviews with a 20 percent sub-sample of 2028 patients who visited the Yale-New Haven Hospital Emergency Service during the two-week period from July 9-July 22, 1964 provided the data.

The utilization index was an urgency rating of the conditions for the emergency room visit, under these headings: emergent (required immediate medical attention), urgent (required medical attention within a few hours) and nonurgent (did not require the resources of an emergency service).

The correlates were the dimensions which defined the respondents' socio-economic status.

A Chi-square test of significance, factor analysis, and multiple regression analysis were employed to analyze the data.

This article pointed out, through the use of complex statistical techniques, the relatively unspecified and global character of socio-economic status as a predictor of nonurgent utilization of emergency room services.

Occupational and educational attainment, which have traditionally been found to be related to medical care utilization in various settings, were not found to be related to the urgency of the presenting condition in this study.

The precise impact of socio-economic status on the presentation of nonurgent complaints in the emergency room is unspecified. However, significant intervening variables, such as income, age, ethnicity and usual medical care patterns, exerted varying influences on the utilization of emergency room services.

The authors attempted to construct more appropriate predictive indices for the urgency of presenting complaints. In each of these models, the patient's age was an especially important predictor of use urgency.

90. Lerner, M., 1961. *Hospital Use by Diagnosis Research Series No. 16*, Center for Health Administration Studies. Chicago: University of Chicago Press.

This study compared the hospital utilization experience of two populations.

Claims records of a sample of the Blue Cross population in Indiana and of an insurance plan in Saskatchewan provided the data.

The utilization indices were admissions per 1000 population, the average duration of hospital stay per admission, and patient-days in the hospital per 1000 population.

Age, sex, diagnosis and insurance plan comprised the correlates.

A cross-tabulation of percentage distributions and graphs were employed to analyze the data.

Hospital use was much higher in Saskatchewan than in Indiana. Age-sex composition accounted for only a small part of this difference.

Hospital use was also higher among nearly all diagnostic categories. The two leading contributors to higher use in Saskatchewan by diagnosis were obstetrical care and respiratory disease. But the Indiana population, too, showed high use in these same categories. The difference primarily was in the volume or level of use.

The author suggests that the precise reason for this difference remains unexplained. Is it possible, he asks, that there are two different patterns of illness in the two populations?

See also:

Lerner, M., 1960. *Hospital Use and Charges by Diagnostic Category - A Report on the Indiana Study of a Blue Cross Population in 1956*. Research Series Number 13, Center for Health Administration Studies. Chicago: University of Chicago Press.

91. Lerner, M. and O. W. Anderson, 1963. *Health Progress in the United States: 1900-1960*. Chicago: University of Chicago Press.

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This book is a classic examination of the major trends in health status and utilization in the first half of the century. For a summary of the main points see *Measuring Health Levels in the United States 1900-1958* by Odin W. Anderson and Monroe Lerner. Research Series No. 11, Center for Health Administration Studies. Chicago: University of Chicago Press.

92. Lowry, S., et al., 1958 "Factors associated with the acceptance of health care practices among rural families." *Rural Sociology* 23 (June): 198-202.

This study explored the effect of selected factors on rural families' use of health services

Interviews with a random sample of 611 family households in two rural counties in North Carolina provided the data.

The utilization index was a score based on whether any family member used the following services: 1) a source of health information, either a recognized medical source or a nonmedical source; 2) the health department; 3) a dental checkup within 12 months; 4) a visit to or advice from a public health nurse within 12 months; 5) a physical checkup within the past year for any reason other than for an illness or an accident; 6) a chest X-ray within the past 12 months; 7) typhoid shots; 8) immunizations for children under 5; 9) polio shots for children 6 months to 20 years of age; and 10) prenatal care.

The correlates were occupation of the household head, ages of the male and female heads, education of the household head, social participation, income, socio-economic status, race and home tenure (rent or ownership).

A Chi-square test of significance was used to analyze the data.

Race and home tenure were the only two independent variables found to be related significantly to the utilization index.

93. Ludwig, E. G. and G. Gibson, 1969. "Self perception of sickness and the seeking of medical care." *J. Health Soc. Behav.* 10 (June): 125-133.

This study assessed the influence of self perceptions of illness on the seeking of medical services.

Interviews with applicants for Social Security benefits who were divided into two experimental groups provided the data. Members of group one reported their health to be poor or worse, but had not been to a hospital or clinic nor had they visited a physician, hospital or clinic. Members of group two also reported themselves in poor health but they had seen a doctor or visited a hospital or clinic.

The utilization measure for these two poor-health groups was no medical contact within the past six months or a medical contact in that time period.

There were three correlates. 1) recognition and significance attached to symptoms, according to the type and number of symptoms. 2) the degree of difficulty in seeking medical care based on present household income, welfare history, and income and welfare history combined; and 3) faith in the system (scientific medical orientation, agency orientation, anomie).

A Chi-square test of significance was used to analyze the data.

Two life situational factors, income and welfare history, and the three measures of system orientation were found to be related to the seeking of care. Urgency and the number of symptoms were not. Subjects with low incomes, recent welfare contact and negative system orientations were most likely to fail to seek medical services.

The authors suggest that since negative system orientations are likely to be associated with low income and welfare experience, negative orientations may result from the situational factors and serve as rationalizations for failure to seek health care.

94. Morris, N., et al., 1966. "Alienation as a deterrent to well-child supervision." *Amer. J. Pub. Health* 56 (November): 1874-1882.

This study explored the relationship of social isolation and perceived sense of powerlessness to mothers' seeking of preventive services for their children.

Household interviews with a sample of 246 Negro and white mothers and the medical records of their 10-month-old babies who were enrolled in the North Carolina Memorial Hospital Well-Baby Clinic provided the data. The interviews were conducted over an 11-month period.

The utilization index was the number of immunizing inoculations received during the first 9 months of the infant's life.

The correlates were Dean's alienation scale, incorporating social isolation and powerlessness; race; occupational stratum of the father; and education of the mother and father.

A Goodman and Kruskal gamma was used to measure the strengths of the relationships.

Findings reveal that the greater the social isolation and sense of powerlessness, the fewer the number of immunizations received by the infant.

Powerlessness and social isolation were greater among Negroes, those in the lower occupational strata, and the less educated.

Whites within the lowest occupational stratum, whether or not they were socially isolated, were likely to seek care. Less educated whites sought care whether or not they indicated a sense of powerlessness. And the more educated whites sought care whether or not they indicated social isolation.

Negroes did not seek services whether or not they indicated alienation. The authors suggest that at the high level of alienation indicated by the Negro respondents, differences in alienation would have no appreciable impact on their care-seeking.

95. Morris, N., et al., 1966. "Deterrents to well-child supervision." *Amer. J. Pub. Health* 56 (August): 1232-1241.

This study examined the impact of various maternal social and social-psychological characteristics on the seeking of well-child supervision.

Household interviews over an 11-month period with a sample of 246 Negro and white mothers and the medical records of their 10-month-old babies who were enrolled in the North Carolina Memorial Hospital Well-Baby Clinic provided the data.

The utilization index was the number of immunizing inoculations received during the infant's first 9 months of life.

Correlates describing the mother's pattern of health care seeking for the child, her own background characteristics, and factors specifically relating to her use of the clinic were examined.

The mother's pattern of health care seeking for her child was described by the number of missed appointments; the number of visits made for well-child care; and the number of visits for illness during the baby's first 9 months.

Background characteristics included race; age; education; family and household structure; the number of pregnancies and number of live births still living; and past preventive care seeking (time of initiation of prenatal care, number of polio vaccinations received by the mother, and the proportion of siblings who received at least three DPT inoculations).

The relationship of various external factors (distance from the clinic, transportation, need for babysitters) and internal factors (attitudes toward clinic and personnel; reactions to prenatal, obstetric and pediatric experiences at Memorial Hospital; who decided to bring the baby to the clinic; the mother's perception of the baby's growth; reactions to hypothetical medical crises; agreement with statements concerning the purposes of well-child supervision; and alienation, powerlessness and social isolation based on Dean's alienation scale) to use was also examined.

Goodman and Kruskal gamma was used to measure the strength of the relationship. The findings showed that a large family, low social class and negative attitudes

do serve as deterrents to seeking well-baby health services.

The number of inoculations strongly correlated with the total number of visits for well-child care. The higher the number of missed appointments, the lower the number of inoculations. The total number of visits for illness was not associated with the number of inoculations.

The higher the parents' education and father's occupational stratum, the greater the number of inoculations. As the number of children for whom the mother was responsible increased, the number of inoculations decreased.

The higher the number of pregnancies of the mother and number of live births still living, the lower was the number of inoculations.

The number of inoculations was also directly related to the mother's early initiation of prenatal care, to the number of polio vaccinations she received and to the proportion of siblings who received inoculations.

The more economically-based external difficulties a mother listed, the fewer was the number of immunizations received by the study child.

Responses to questions about internal factors relating to the clinic showed these factors to be less important as deterrents than the other measures. Negro mothers had less favorable opinions of the clinic, but there was no significant association with the number of inoculations. In fact, the number of inoculations was greater for mothers who stated something unfavorable about the clinic.

There was no significant association between who decided to bring the child to the clinic and the number of immunizations. The number of inoculations was significantly greater if the mother perceived the child's development to be greater than that of other babies.

Responses to hypothetical health problems were not significantly related to the number of immunizations, but agreement with statements concerning the purposes of well-child supervision were positively associated with the number of inoculations. The greater the alienation, sense of powerlessness and social isolation, the fewer was the number of inoculations.

96. Muller, C., 1965. "Income and the receipt of medical care." *Amer. J. Pub. Health* 55 (April): 510-521.

This study summarized the relationship between income and utilization of health services.

Information came from a review of the literature and NCHS data.

The utilization measures were family medical spending, public medical care spending, physician visits per year, specialist care, preventive care, and hospital admission rates and length of stay.

The relationship of each of these kinds of use to income was noted.

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Family spending for medical care increased sharply with income.

Public medical care spending was fragmented, the quality of services varied and the means test for eligibility was stringent.

National Health Survey (NHS) data for 1963-64 showed that physician visits per person per year were lower for low-income groups (4.6) than for high-income groups (5.7). This difference was even more apparent for children under 15.

NHS data indicated consistently higher use of specialists by high-income families.

High-income families used more preventive services.

NHS data documented that hospital discharges per 1000 persons were less for the low-income person, but the average length of stay was longer.

##### National Center for Health Statistics Publications

The following 42 summaries (97-139) digest National Center for Health Statistics reports.

We have included only those reports relevant to utilization in four NCHS Series: those from Series 10 (97-122) summarize Health Interview Survey data; those in Series 12 (123-131) reprint reports on institutions for the aged and chronically ill, mental hospitals and nursing and personal care homes; those from Series 13 (132-137) summarize and reprint data from the Hospital Discharge Survey; and two reports relevant to obstetric health care from Series 22 (138-139) are reprinted.

Hospital discharge data is for civilian populations only.

##### Series 10:

###### 97. 1963. *Family Income in Relation to Selected Health Characteristics. No. 2.*

The highest rate of hospital discharges was reported by persons with annual family incomes of \$2000-3999. This group averaged 8.3 hospital days per discharge. Those under \$2000 had lower discharge rates but longer stays and those with incomes of \$4000 or more reported lower discharge rates and fewer days per discharge than the lower income groups. High rates for those earning less than \$4000 are associated with high proportions of those over 65.

The hospital discharge rate for females was considerably higher than the corresponding rate for males. The proportion of persons covered by hospital insurance ranged from 39 percent for persons with family incomes under \$2000 to 80 percent for those with incomes of \$7000 or more.

Regardless of income level, persons with no insurance payment for their hospital bill had longer average lengths of stay than those where hospital costs were either fully or partly covered by insurance.

###### 98. 1964. *Current Estimates from the Health Interview Survey: United States - July 1962-June 1963. No. 5*

There were 12 discharges per 100 persons per year in July 1962-June 1963.

The high rate of discharges for women 17-49 years of age is explained by hospitalization for childbirth.

###### 99. 1964. *Medical Care, Health Status, and Family Income: United States - 1963. No. 9.*

The rate of discharges from short-stay hospitals was somewhat lower among persons with low annual family incomes than among those with higher incomes. A larger proportion of persons in low-income families had multiple hospitalizations than those in higher income groups.

Low-income and high-income individuals had the longest lengths of stay with the percentage for the low income slightly above that for the high income. The percentages of those with hospital stays in excess of two weeks were lowest for those in the higher income groups.

The proportion of hospital discharges for those who had surgical procedures was less among persons of low income than among those with high income.

Persons in families with incomes under \$4000 averaged 4.6 physician visits per year and those in families with incomes of \$7000 or more averaged 5.7 visits per year.

The relative increase in rates of physician visits from low to high family income was about the same for males and females, even though the level of the rates was higher for females because of obstetric visits.

The pattern of utilization of physician visits is quite clear-cut showing an increase of visits with advancing age and with increase in family income.

The rate of physician visits (5.7) for children under 15 living in families with \$7000 or more income was approximately twice that of children in families with incomes of less than \$2000 (3.0).

The percentage of persons with family incomes of \$4000 or more receiving the services of specialists was higher than the percentage among those with incomes less than \$4000.

The amount of dental care that people received varied directly with the amount of family income. Only 19 percent of the persons living in families with less than \$2000 income visited the dentist during the year as

compared with 54 percent of those with family incomes of \$7000 or more.

Among children under 15, only one out of four of those in families with incomes of less than \$2000 had ever had any dental care, while three out of four children in the \$7000 or more income group had visited a dentist at least one time.

During the period July-December 1962, the average person in the United States spent \$129 per year for health-related services or products. Expenditures per person ranged from \$112 for people living in families with less than \$2000 income to \$153 per person for those in families with income of \$7000 and over.

Amounts spent for doctors' services comprised about a third of the total health expenditures.

The amount of health expense (\$104) for a child living in a three-member family with an income of \$7000 or more was 5 times greater than the amount spent for health care for a child in a family with 7 or more members and an income less than \$2000.

About 18 percent of the population had no expense for health care services during the 12-month period. This proportion varied from 11 percent among persons with family incomes of \$7000 or more to 30 percent for persons with family incomes of less than \$2000.

The amount of health expenses increased with advancing age and was greater for females than for males.

The rate for persons using hearing aids among families with incomes of less than \$4000 is higher than that for persons in families with incomes of \$4000 or more because of the disproportionate number of older persons in the low-income group. The use of bras and artificial limbs is more evenly distributed by age in the population.

**100. 1964. Current Estimates from the Health Interview Survey: United States - July 1963-June 1964. No. 13.**

Statistics from this survey showed 23.8 million hospital discharges - 12.8 discharges per 100 persons per year. The discharge rate for males increased with age. Among females, the rate was highest during childbearing years, 17-44, declined from 44-64 and then increased for those 65 and older.

There were 4.5 physician visits per person, slightly less than the 4.7 reported during the July 1958-June 1959 period. Within six months of the 1963-1964 interview, 50.3 percent of those surveyed had seen a physician. Only 1.3 percent had never seen a physician.

There were 1.6 dental visits per person, slightly more than the 1.5 of the July 1957-June 1959 period. This survey reported that 42 percent made at least one dental visit during the year prior to the interview, an increase of 5.4 percent over the July 1957-June 1958 period. The percentage for persons 15-24 who visited the dentist at least once was 55.2.

**101. 1965. Volume of Physician Visits by Place of Visit and Type of Service: United States - July 1957-June 1964 No. 18**

From July 1963-June 1964 there was an average of 4.5 physician visits per person per year. The site of 70 percent of these visits was a physicians' office.

Eighty-one percent were for diagnosis and/or treatment of an illness or injury and 9 percent for general exams. Vaccinations accounted for 5 percent of the visits and the remainder were for obstetric and other care.

Males under 15 averaged more physician visits per year than females. Females over 15 had a higher rate because visits for prenatal and postnatal care were included.

Families whose heads had less than 5 years of education averaged 4 visits per year, while those whose head had attended college averaged 5.4.

Persons living in SMSAs averaged 4.8 visits per person per year while those outside these designated areas had 4.2 visits. The West had the highest rate of visits among the regions.

Whites had 4.7 visits; nonwhites had 3.3 visits. Families under \$2000 had 4.3 physician visits; families earning \$10,000 or more had 5.1 visits.

Single persons had a lower rate of use than the married, separated or divorced. Persons with the greatest degree of activity limitation made the largest number of visits per person per year.

**102. 1965. Physician Visits - Interval of Visits and Children's Routine Checkup: United States - July 1963-June 1964. No. 19.**

As income rose, there was a steady increase in the proportion of those making physician visits. More chronic conditions were reported by those in the lower income groups. More preventive visits were reported by higher income groups, whites and those with higher educational levels.

Limited activity was reported by the aged and more women than men reported activity limitation.

Marital status, adjusted for age, showed the widowed had the highest rate of physician visits per year and the never-married, the lowest.

At least one physical exam during the past year was reported for 36.3 percent of the children under 17. The proportion was slightly higher for males than females and substantially higher for children under 6 than for those 6-16. These proportions were highest in metropolitan areas, in the Northeast, and among the well-to-do, whites and those whose family head had more education.

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**103. 1965. Persons Hospitalized by Number of Hospital Episodes and Days in a Year: United States -- July 1960-June 1962.** No. 20.

One or more hospitalized illness episodes were reported for each 93 persons per 1000 population. The rate increased for males with advancing age. The rate for females increased sharply in the childbearing years, 15-44.

Only one episode of hospitalization was reported by 86.2 percent; 13.8 percent had multiple episodes, but only 2.8 percent of that 13.8 percent had more than two episodes. Multiple hospitalizations occurred most frequently among those with low incomes, those living alone or with nonrelatives and those living in the West.

A single episode of 1-7 days was the most common pattern of hospital stay, with those over \$2000 income having a slightly higher percentage of single episodes than those with incomes under \$2000.

There were 9.6 hospital days per person hospitalized per year. Females, 15-44, averaged 6.4 hospital days per year, compared with 8.2 for females of all ages. Children of both sexes had relatively short stays, averaging 6.9 days per year. In all age groups, males had more hospital days than females.

**104. 1965. Personal Health Expenses: Distribution of Persons by Amount and Type of Expense: United States -- July-December 1962.** No. 22.

Data for this report came from mail-in questionnaires left with the respondent during the Health Interview Survey, July-December 1962.

Health expenses of under \$50 were reported by 34.1 percent of those surveyed; 18.2 percent had no reported medical expenses.

Including those under some free-care arrangement, 87.9 percent had no hospital expense.

No doctor expense was reported by 38.5 percent.

No medicine expense was reported by 32.8 percent.

No dental expense was reported by 61.7 percent.

No other expense, such as those for eye glasses, hearing aids or appliances, was reported by 75.6 percent.

The proportion of those with an expense was higher among females than among males in each reported category. As age increased, there was a general leveling of the percentage with no expense and a compensating shift toward higher expenditures. A similar pattern was noted with respect to rising family income and increase in educational level of the head of household.

**105. 1965. Volume of Dental Visits: United States -- July 1963-June 1964.** No. 23.

From July 1963-June 1964 there were 16 dentist visits per person per year.

Persons under 5 and over 64 had the lowest rates of dental visits. The rate for females was 1.7; for males it was 1.4.

By residence, rates for people in metropolitan areas (1.8) was greater than those outside metropolitan areas, both farm (0.9) and nonfarm (1.2). The rate for the Northeast was almost twice that of the South.

Those families with less than \$2000 family income made 0.8 visits per person as compared with 2.8 for those families earning over \$10,000.

Rate of dentist visits was 0.9 for nonwhites and 1.7 for whites. Differences in rate by race were less when family income groups were considered separately.

Educational level of household head was independently related to use. The higher the educational level of the household head, the higher was the use of dentist services.

The rate for never-married people over 17 years of age was greater than the rate for married persons or for the widowed and divorced.

Fillings and examinations were included in the highest frequencies of visits, two out of five and one out of five of the visits, respectively. The percent of visits at which teeth were filled peaked in the 15-24 year old group and declined thereafter. The proportion of visits for extractions and surgery increased with age among persons under 25 and then leveled off, while the proportion of visits for exams decreased with age up to 25 and then remained constant through the middle years. Orthodontic services were performed mostly for those 5-24 years of age. The percent of visits for denture work increased with advancing age.

**106. 1966. Personal Health Expenses -- Per Capita Annual Expenses: United States -- July-December 1962.** No. 27.

Total health expenses increased directly with age. For children under 6, expenditures for hospitals, doctors, and medicine were greater, while for those 6-16, expenses for dental care were greater. For those over 16, all types of expense showed a steady increase with age (except for dental care for those over 65).

Health expenses were higher for females than males with most of the difference accounted for by females in the child bearing years.

All types of health expenses increased with educational level — largely because of the greater use of preventive services among the better-educated.

Personal health expenses for all services increased as the level of family income increased.

Personal health expenses for the non-white population were approximately two-thirds the level reported for the whites, regardless of type of health expense. The gap closed somewhat when income and education were considered, though this did vary by the type of expense. For instance, hospital and doctor expenses came closer together as income increased, while the gap widened for dental care and medicine.

There was a gradual decrease in health expenses of all kinds for families of three or more as family size increased.

There was a significant increase in expense for all health services except dental as severity of chronic limitation increased.

Persons with hospital insurance coverage reported higher expenses.

Expenses for rural people who live on farms were much less than those in urbanized areas. Per capita health expenses were higher for those in the West than for other geographic regions, regardless of the type of expenditures.

By occupational groups, white-collar workers spent more for doctor and dentist services than blue-collar workers.

**107. 1966. Dental Visits - Time Interval Since Last Visit: United States - July 1963-June 1964. No. 29.**

One or more dental visits within the year were reported by 42 percent; 16.6 percent had never seen a dentist.

Fewer persons at the extremes of the age range - under 5 and over 65 - had seen a dentist in the past year than had persons in the other age groups. Persons 5-24 had the highest percentages of use. In all age groups, a larger proportion of females than males had visited a dentist within the year.

An estimated 44.6 percent of white persons compared to an estimated 22.7 percent of the nonwhites had had a visit. This differential was reduced somewhat when income was controlled.

A larger percentage of never-married persons had recent dental visits than the presently married or widowed.

Education and income were found to be strongly and independently related to dental use. Those with higher educational levels and higher incomes reported the highest dentist use.

Of those living in SMSAs, 44.7 percent had visited a dentist recently; of those non-farm, non-SMSA residents, 38.1 percent had visited the dentist; 33.7 percent of farm residents reported dentist visits.

Persons living in the Northeast had the highest percentage of dental visits (47.7 percent), while the proportion in the South (34.9 percent) was much lower than the country as a whole or any other region.

**108. 1966 Hospital Discharges and Length of Stay. Short-Stay Hospitals United States July 1963-June 1964. No. 30.**

There were 24.8 million discharges, 133.7 per 1000 persons. The average length of stay per discharge was 8.4 days

Though the rate of discharge is greater for females than males, if hospitalization for delivery is excluded, the gap narrows. The average length of stay per discharge for males was 9.9 days and 7.4 days for females for all discharges and 8.5 days for discharges not for delivery.

The rate of discharge was highest and the average length of stay was longest among persons aged 75 years and older. In general, the rates for males rose consistently with increasing age. Among females the rate of discharges peaked among women aged 15-44.

The rate of discharge was greater for whites than nonwhites. The average length of stay was appreciably longer for nonwhite males but only slightly longer for nonwhite females. These differences did vary by age groups - 15-24 year old women and 65 and older of both sexes had longer stays and more discharges.

Annual hospital discharge rate was highest for persons residing in the South and lowest in the Northeast. But the average length of stay was shortest in the South - 7.5 days compared with 9.2 days for persons in the Northeast. This is the result of the short stays for 15-24 year olds in the South and longer stays for 45 and older in the Northeast.

Persons in non-farm areas outside of metropolitan areas had the highest annual rate of hospital discharges. The rates for farm residents and metropolitan residents were quite similar. Patients in metropolitan areas had the longest stays - an average of 8.7 days compared with 7.4 days for non-farm and 6.0 days for farm residents.

About 64.9 percent of all discharges from short stay hospitals and 62.0 percent of all hospital days occurred in nongovernmental non-profit hospitals.

Surgery was performed during 52.7 percent of the hospitalizations. Delivery accounted for 27.5 percent of the total. The second leading form of surgery was tonsilectomy and/or adenoidectomy.

The single largest category for hospitalization was delivery - 15.4 percent of all discharges. Injuries were the second leading cause.

Families with income over \$10,000 had the lowest rate of hospital discharges (116.5 per 1000). Persons with incomes of \$2000-3999 had the highest rate (145.6 per 1000).

These differences are related to the higher birth rate for low-income females and the substitution of hospital for physician services. The average length of stay was also longer among the low-income groups perhaps because of putting off treatment.

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Lowest rate of hospitalization was for the lowest education groups -- while the average length of stay was longer.

The never-married group aged 17 and over had the lowest rates of hospital discharges, while females reported as presently married had the highest rate of discharge.

More aged reported limited activity and more females than males.

**109. 1966. *Age Patterns in Medical Care, Illness, and Disability: United States - July 1963-June 1965.*** No. 32.

Hospital discharges from short stay hospitals increased with advancing age from 115.2 per 1000 persons under 45 to 195.6 per 1000 persons, 75 or older. Hospital stay increased and the proportion with surgical treatment decreased as age increased. Among those over 65, the rate of discharge was higher among males in the South and among non-farm residents outside SMSAs. Diseases of the heart were responsible for admission for those over 65 in about 11 percent of the cases. Vascular lesions and fractures were responsible for the longest stays.

The rate of physician visits increased from 4.1 per person per year for those under 45 to 5.0 for those 45-64 and 6.7 for those 65 years and older. For those over 65, too, physician visits shifted from the home to the office. About two-thirds of the population was seen by a physician at least once during the year prior to the interview.

**110. 1966. *Cost and Acquisition of Prescribed and Nonprescribed Medicines: United States - July 1964-June 1965.*** No. 33.

An annual approximate average expenditure of \$21.00 per person for medicines was reported; \$15.40 for prescribed and \$5.00 for nonprescribed drugs.

The average cost per person for prescribed and nonprescribed drugs rose with age.

Females spent more than males for prescribed medicines (\$18.69 compared to \$12.00) though the sex difference was slight for nonprescribed medicines.

White persons spent more than nonwhite for both prescribed and nonprescribed medicines.

Average cost of prescribed medicines rose steadily with income and education.

As the degree of activity limitation increased in everity, the annual expense for medicine rose.

Persons in metropolitan areas had greater expense for medicines than did farm residents or those in non-metropolitan areas. Expenditures per person were higher

in the South and West than in the Northeast and North Central region.

The average cost was highest for persons in two-member families and lowest for persons in families of seven or more. The average number of acquisitions per person was 4.7.

Drug stores were the purchase site for 65.3 percent of nonprescribed medicine; 20.1 percent were purchased in grocery stores.

**111. 1967. *Health Characteristics by Geographic Region, Large Metropolitan Areas, and Other Places of Residence: United States - July 1963-June 1965.*** No. 36.

The rate of hospital discharges was highest among non-farm residents outside an SMSA and lowest for farm residents. The rate of discharge was somewhat lower for the Northeast. The rate of surgically treated discharges was higher than that for non-surgically treated discharges in SMSAs, while the situation was reversed among farm and non-farm residents living outside of metropolitan areas.

Average physician visits were 4.5 per year. The rate of visits was highest in metropolitan areas and lowest for farm residents outside SMSAs. Residents of the West reported the largest number of physician visits per person per year. An estimated 69.8 percent of the physician visits reported took place in doctors' offices, 5.4 percent in patients' homes, and 11.9 percent in hospital clinics. The doctor's office was the site of 80.5 percent of the farm population's visits.

There was an average of 1.6 dentist visits per person per year. The number of dental visits was highest among metropolitan residents (2.0) and lowest among farm residents (1.0). Persons living in the Northeast had a much higher rate of visits than did those in the South.

**112. 1967. *Current Estimates from the Health Interview Survey: United States - July 1965-June 1966.*** No. 37.

There were 12.7 discharges per 100 persons and 8.1 days per discharge. The average stay for males was one-third longer than that for females.

The percent of the population with corrective lenses was 48.1. More females than males had lenses. The majority of both sexes over 45 had corrective lenses.

**113. 1967. *Prescribed and Nonprescribed Medicine: Type and Use of Medicines: United States - July 1964-June 1965.*** No. 39.

About 25 percent of the prescribed drug acquisitions were for respiratory conditions.

The proportion of purchases for treatment of circulatory conditions increased with age. About a third of the acquisitions purchased for persons under 25 were for the treatment of colds, coughs, throat conditions and influenza.

The average price per prescription for persons under 25 was less than that for older persons.

The types of nonprescribed medicines for which expenditure per person was greatest were aspirin and aspirin compounds, vitamins and preparations for respiratory conditions. As with prescribed medicines, use of some types of medicine showed an increase in use with age.

**114. 1968. Current Estimates from the Health Interview Survey: United States - July 1966-June 1967. No. 43.**

During July 1966-June 1967, there were 3.5 million discharges from short-stay hospitals among persons 65 years and older, in contrast to 3.1 million during the previous year, representing an increase from 17.7 to 19.7 discharges per 100 persons. This may represent the impact of the Medicaid program, enacted in 1965.

During the year July 1966-June 1967 there was an even more dramatic increase in hospital utilization in terms of days, from 225.3 days per 100 to 271.1, representing an increase of 20.3 percent. The increase for all ages was approximately 5 percent.

The percentage of persons 65 years and older who saw a physician rose to 70.5 percent from 68.8 percent (July 1963-June 1964). The frequency of visits for persons 65 and older was 6.0 per person per year, compared with 6.7 visits during July 1963 through June 1964. This trend was characteristic of all age groups, however, perhaps because of the lower incidence of acute conditions during 1966-67.

**115. 1968. Volume of Physician Visits: United States - July 1966-June 1967. No. 49.**

There were 4.3 visits per person per year compared with 4.5 visits per person reported for July 1963-June 1964. This reduction was probably due to the lower incidence of acute conditions.

The age pattern of physician visits differed for males and females.

The number of visits was highest among residents of SMSAs and lowest among persons living on farms outside of SMSAs. The annual number of visits was highest in the West and lowest in the South. Lesser utilization by children in the South accounted for the low rate in this region.

For children there is a direct relationship between family income and use of physicians' services, probably due to the use of preventive services by the well-to-do. The high rate of use for persons earning less than \$3000 reflects both the need for medical care among the elderly and the availability of free care through physi-

cians and public clinics for the needy. Adjustment for differences in family income had little effect on different rates of use for whites and nonwhites.

As the level of educational attainment of the head of family rose, the annual number of physician visits per person also increased. This was especially true for the younger age groups whose knowledge of preventive-care benefits increased with education.

The number of physician visits was highest among widowed and separated persons and older females.

Among persons with one or more chronic conditions, the rate of physician visits increased with severity in activity limitation. Persons with no chronic conditions had a low number of physician visits per person and this tended to decline with age either because of declining incidence of acute illness or because they didn't visit the doctor often enough to find out they had a chronic limitation.

The proportion of physician visits occurring in offices increased to 71.8 percent in 1966-67 from approximately 61 percent in 1957-58. The proportion visiting hospitals or clinics for physician services is two times greater for those earning less than \$3000 than for those earning \$10,000 or more.

The average charge for an office visit was \$7.80; for a physician visit to the home, it was \$7.00.

A general practitioner was reported as being seen for 64.0 percent of all office visits.

About 31.9 percent of the civilian, non-institutionalized population reported no physician visits within a year of the interview.

**116. 1969. Persons Hospitalized by Number of Hospital Illness Episodes and Days in a Year: United States - July 1965-June 1966. No. 50.**

One hundred persons per 1000 were hospitalized during July 1965-June 1966. The rate among males increased with advancing age. Among females this pattern was broken by the high rate among those of childbearing age, 15-44 years.

About 85.8 percent of the persons with one or more hospital episodes had only one episode of hospitalization in the year. Multiple episodes were more frequent among persons with low family income, living alone or with nonrelatives, divorced or separated or living in the North-Central region or the South.

A single episode of 1-7 days was the most common pattern. Among persons with family incomes less than \$3000, 53.5 percent experienced single episodes of 1-7 days compared with 66.5 percent for those with families of \$3000 or more.

The average stay was 9.4 hospital days per person hospitalized during the year. Because of the great number of hospitalizations of females 15-44 years of age for delivery, males on the average had more hospital days than did females.

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### 117. 1969. *Characteristics of Persons with Corrective Lenses: United States - July 1965-June 1966.* No. 53.

The proportion of the population owning corrective lenses increased with age. Females 25 years and over obtained corrective lenses much earlier than did males of comparable ages. This difference was greater among those 45 years of age and older.

High family income (\$5000 or more) and educational level of the head of the family (13 years or more) were characteristic of the population receiving recent eye examinations from ophthalmologists.

### 118. 1969. *Family Use of Health Services. United States - July 1963-June 1964.* No. 55.

The rate of physician visits was 16.2 visits per family per year. As family size increased, the rate of physician visits rose accordingly, though at a lesser rate as size increased.

The number of physician visits per family was highest for families whose head was under 45 years of age.

Husband-wife families with a child under 17 had the highest rate of physician visits among the family groups. The rate of physician visits for unrelated individuals was highest for those persons 65 years of age and older, the largest group of individuals living alone.

In general, the rates of physician visits for all families and those families with three or more members increased with use as income and education rose. Rates for two-person families did not vary much because of the number of older persons characteristically used services at a higher rate regardless of income and education.

Physician visit rates were also higher for white families, those living in the West, and in SMSAs.

The number of visits per 100 families to medical specialists and/or practitioners varied by income, education, color, region and residency.

The number of short-stay hospital discharges per 100 families showed a tendency to decline with increase in family income. The discharge rate was highest for families whose head had some high school education. They were somewhat higher for white families than for nonwhite families. The number of discharges per 100 families per year was slightly higher in the South than other regions and for non-farm residents outside SMSAs than for other residence categories. These findings for families parallel those found for individuals.

There was a greater tendency toward use of dental services as family income and educational level increased. There was greater use of dental services by whites than nonwhites, though income explains some of

See also reference number 108.

this difference. The number of visits was highest in SMSAs and lowest in farm areas outside an SMSA.

### 119. 1969. *Differentials in Health Characteristics by Color: United States - July 1965-June 1967.* No. 56.

White persons averaged more physician visits per person than did nonwhites, regardless of age or sex. White and nonwhite differences were greatest among children under six.

At all income levels, white persons had higher age-adjusted rates of physician visits than did nonwhite persons. Although the white population showed increased use of physician services with income, this trend was not apparent among the nonwhite. (A possible intervening variable may be family size.) Among nonwhites the middle income group had the lowest rate of physician visits.

The percent distribution of physician visits by family income and place of visit showed that relatively more white than nonwhite persons consulted with physicians in the home or in the office and by telephone, whereas relatively more nonwhites visited doctors in hospital clinics or emergency rooms.

In each age group a larger proportion of white than nonwhite persons reported episodes in short-stay hospitals during the year prior to interview. The differences between whites and nonwhite persons were greater among males than females and for ages 45 and over. The distribution of the white and nonwhite populations by number of hospital episodes was quite similar.

Relatively more nonwhite (27.7 percent) than white males (19.9 percent) had hospitalizations of 15 days or more, and fewer had hospitalization of a week or less (50.1 percent and 60.8 percent, respectively).

### 120. 1970. *Current Estimates from the Health Interview Survey: United States - 1968.* No. 60.

There were 4.2 physician visits per person per year. This shows a slight decrease from 1967. Approximately 55.1 percent of the population had visited a physician six months prior to the interview and about 71.2 percent within the past year. Except for persons under 12, more females than males had recently seen a physician.

There was an average of 1.3 visits per person per year. Females in each age group had higher rates than males. Rates among males increased slightly until age 65, whereas the rates for females peaked in the 17-24 age group.

The number of hospital discharges (12.2 per 100 persons per year) was essentially the same as the rates for calendar year 1967. Slightly higher rates did occur among persons 65 and over.

The average length of stay was 9.4 days, an increase from 8.5 days in 1967. Longer stays occurred particularly for those over 65.

About 9.5 percent of the population had one or more hospital episodes during the year, the majority of those hospitalized had a single episode. Females generally averaged fewer days than males except for those over 65 who had multiple episodes.

**121. 1971. Children and Youth - Selected Health Characteristics. United States - 1958 and 1968. No. 62.**

The age-sex pattern of hospital discharges in July 1957-June 1958 was similar to that for 1968. The average length of hospital stay for children under 15 was approximately the same for boys and girls - 5.5 days. Among young people 15-24 the average length of stay for females was shorter because of short-stay obstetric cases. On the average, white children and young people had shorter hospital stays than did nonwhite children and young people.

Children under 5 had more physician visits on the average than did persons in any other age group. Children 5-14 had the lowest average number of visits. The volume of physician visits was higher during July 1957-June 1958 than during 1968.

The majority of physician visits took place in doctors' offices. A relatively high proportion of visits reported at places other than a doctor's office for children under 5 is explained by a large number of telephone calls to physicians.

Except for young women in the childbearing age, the average number of visits for males and females were about the same.

In both time periods white children and young people visited a physician more frequently than did others, though this difference narrowed somewhat between 1958 and 1968.

Children and young people in SMSAs had the highest number of physician visits on the average while those living on farms had the lowest.

Children under 5 living in families with incomes of \$5000 or more had more physician visits on the average than did those in families earning \$5000 or less, which probably reflects a difference in use of preventive services. This disparity was less in 1968 than in 1958.

The majority of children had visited a physician at least once during the year prior to the 1968 interview.

Children 5-14 visited the dentist an average of 1.6 times; young people 15-24 had an average of 1.7 visits. There were substantial differences in the rate of dentist visits between whites and nonwhites.

Children in SMSAs visited the dentist much more frequently than those outside an SMSA.

Family income substantially affected use of dental services. The rate was twice as much for those in families with incomes over \$5000.

The July 1963-June 1964 survey reported an estimated 87 percent of children under 5 and 25 percent of children 9-14 who had never been to a dentist.

**122. 1971. Current Estimates from the Health Interview Survey: United States - 1969. No. 63.**

The number of discharges increased from 12.2 in 1968 to 12.9 per 100 in 1969. The average length of hospital stay was the same during 1969, except for older persons for whom it was longer. About 10.3 percent of the population had one or more hospital episodes during the year.

There were an estimated 4.3 physician visits per person per year. For both sexes the number of visits tended to increase with advancing age. Approximately 54.4 percent of the population had seen a physician during the six months prior to the interview and 69.4 percent within the year. More females than males saw a physician.

There was an average of 1.5 dental visits per person per year, a slight increase from the 1.3 in 1968. Approximately 32.1 percent of the population had visited the dentist recently and 54.0 percent within the past year. About 13.3 percent had never seen a dentist. Compared with earlier years there seemed to be a higher percentage of persons who had recently seen a dentist, while the percentage who had never seen a dentist decreased.

Series 12:

**123. 1965. Characteristics of Residents in Institutions for the Aged and Chronically Ill. No. 2.**

In this report national information about the health and related characteristics of residents or patients in institutions for the aged and chronically ill in the United States is provided for the first time. Data based on a probability sample of about 37,000 residents of institutions such as nursing homes, homes for the aged, and hospitals which specialize in the long-term care of the aged or chronically ill. Statistics are presented on age, sex, color, length of stay and selected health characteristics of residents in these institutions.

Based on estimates derived from this survey, there were about 505,000 residents in 16,370 homes providing nursing and personal care to the aged and chronically ill. In addition, there were about 77,000 patients in 728 chronic disease and geriatric hospitals.

Approximately 70 percent of the residents in the nursing and personal care homes for the aged were at least 75 years of age. The average age was 77.6 years. Approximately 66 percent of the residents were women. Only 4 percent of the residents in the homes were nonwhite.

Besides those in geriatric hospitals, patients in chronic disease hospitals were primarily elderly, but, on the average, they were younger than the residents in nursing

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homes. Nine percent of the patients in these hospitals were nonwhite. This is about the same as the proportion for the total civilian population 20 years of age and over which is nonwhite.

The average duration of stay of residents in these homes as well as the hospitals from the date of last admission to the institution to the date of the survey, was 3 years.

The health status of residents in homes for the aged was related to their age as well as to the type of ownership and primary type of service provided by the home. Disability in terms of ambulation, continence, mental awareness, hearing and vision increased with advancing age of the residents. Residents in proprietary homes had poorer health than those in the nonprofit and government-owned homes. Also, residents in homes providing nursing care as their primary and predominant function had poorer health than those in homes providing routine personal services only.

### 124. 1965. *Characteristics of Patients in Mental Hospitals: United States – April-June 1963*. No. 3.

In this report statistics are presented on selected characteristics of patients in long-stay mental hospitals. The characteristics include age, color, sex, length of stay and certain indices of physical and mental disability. The data were collected during April-June 1963 from a probability sample of mental hospitals in the United States in which patients stay an average of 30 days or more. On the basis of data collected in the survey, it is estimated that there were about 558,000 patients in 414 long-stay mental hospitals. This estimate does not include patients in maximum security and children's wards in these hospitals nor mental hospitals serving children only.

The median age of the patients was 54 years. Males out-numbered females; there were 113 males per 100 females. On the average, males were younger than females and nonwhite patients younger than white. Nonwhite persons, constituting one-fifth of the patients, showed almost twice the rate of white in number hospitalized per 1,000 population.

Patients in the hospital at the time of the survey had a median stay of 6.4 years, ranging from about 3 years for patients under 45 years of age to about 10 years for patients aged 55-64 years. Length of stay varied considerably by type of ownership of the hospital, from a median stay of less than 1 year for nongovernmental hospitals to about 7 years for state and county hospitals.

The patients' health varied mainly with age, with some sex and color differences present. Mental disability was far more severe than physical disability in the hospital population. For example, about half of the patients were unaware of their surroundings part or most

of the time, while only 1 out of every 10 patients was not able to walk unassisted.

### 125. 1966. *Utilization of Institutions for the Aged and Chronically Ill: United States – April-June 1963*. No. 4.

In this report statistics are presented on the number of beds, admissions, discharges, recipients of public assistance, and on the rate of occupancy in institutions for the aged and chronically ill. This is the fourth in a series of reports based on data collected during April-June 1963 in a survey of nursing homes and related facilities, including chronic disease, geriatric and mental hospitals and all types of homes for the aged.

Institutions for the aged (excluding mental hospitals) are classified in this report into four types, depending on the primary type of service provided. The basic utilization statistics are cross-classified by these type-of-service groups, by type of ownership and size of the institutions, and by geographic region.

An estimated 660,000 beds were maintained by 17,100 institutions, of which 88 percent were occupied. Homes providing primarily nursing care maintained about half of these beds and had the highest occupancy rate (90 percent) among the types of institutions. About half of the residents in institutions for the aged were recipients of public assistance.

During 1962 approximately 554,000 persons were admitted to the institutions and 531,000 were discharged. Of the persons discharged, about one-third were because of death. Although over 60 percent of the 1962 admissions were discharged before the end of the calendar year, average length of stay of residents in the institutions at the time of the survey was 3 years. This indicates that many residents stay short periods as well as long periods of time.

### 126. 1967. *Chronic Illness Among Residents of Nursing and Personal Care Homes: United States – May-June 1964*. No. 7.

In this report residents of nursing and personal care homes are described in terms of their health and the health services provided to them. The principal health characteristics are number of chronic conditions and impairments and mobility status; measures of health services include time interval since resident last saw doctor, primary type of service provided by the home, nurse or nurse's aide on duty, supervisory nurse and level of patient care.

At the time of the survey, an estimated 554,000 residents were being cared for in 17,400 nursing or personal care homes. Their median age was 80 years; more than 96 percent of the residents had one or more chronic conditions or impairments. Multiple chronic conditions occurred frequently; the average number for

all residents was 3.1 conditions. This varied from 2.6 for residents under 65 years to 3.4 for those 85 and over.

Almost two-fifths of the residents were limited in mobility to their bed or room. As number of conditions increased, the resident's mobility decreased. The proportion of bed or room limited residents increased with age. The increase was greater for room limited residents than for bed limited ones. A higher proportion of females than males were room limited and, to a lesser extent, bed limited.

Number of conditions was related to the interval since the resident last saw a doctor while in the home. Bed limited residents had seen a doctor more recently than others. In this respect, bed limitation was a more significant factor than number of conditions in determining interval since doctor was last seen.

Type of service provided was related to number of conditions and mobility status. Nursing care homes provided service to a larger proportion of residents with multiple conditions than did other homes. Residents with five or more conditions constituted one-fourth of all residents in nursing care homes compared with one-eighth of those in personal-care-with-nursing homes and one-sixteenth in personal care homes.

Among homes having a nurse or nurse's aide on duty 24 hours, those with a registered nurse supervising nursing care had residents with more conditions than those without. Sixty percent of all residents received some level of nursing care during the week prior to the survey. Level of care was associated with number of conditions and impairments, but many residents with multiple conditions either received only minor nursing service or none at all.

**127. 1967. Prevalence of Chronic Conditions and Impairments Among Residents of Nursing and Personal Care Homes: United States - May-June 1964 No. 8.**

In this report residents of nursing and personal care homes are described in terms of their health and related characteristics and certain health services available to them in these homes. Health and related characteristics of the residents include chronic conditions and impairments, mobility status, and length of stay in the home. Measures of health services include time interval since resident last saw a doctor in the home, primary type of service provided in the home, nurse or nurse's aide on duty, and a supervisory nurse.

At the time of the survey, the nation's 17,400 nursing and personal care homes had an estimated 554,000 residents, 15 percent of whom were 85 years of age and over. On the average there were 3.1 conditions per residents and only 4 percent had no chronic conditions or impairments.

The highest prevalence rates among residents were for the major cardiovascular conditions, vascular lesions affecting the central nervous system and diseases of the

heart. Males had higher prevalence rates than females for such chronic conditions as diseases of the heart, malignant neoplasms and for diabetes mellitus, vascular lesions, advanced senility and arthritis and rheumatism.

Over one-third of the residents with impairments due to stroke were bedridden as compared with one-fourth with vascular lesions (with or without mention of impairments) and one-fifth with diseases of the heart.

The shortest median lengths of stay were for residents with malignant neoplasms, diabetes mellitus and fracture of the femur (old). Only a small proportion of the residents had not seen a doctor since entering the home.

In homes having a nurse on duty 24 hours the highest prevalence rates prevailed for residents with vascular lesions, diseases of the heart, advanced senility and arthritis and rheumatism. For those with a nurse on duty less than 24 hours the leading conditions were other mental disorders, diseases of the heart, hearing impairments and vascular lesions.

The conditions most closely related to increasing age included advanced senility, diseases of the heart, arthritis and rheumatism, severe visual impairments and hearing impairments.

**128. 1968. Nursing and Personal Care Services Received by Residents of Nursing and Personal Care Homes. United States - May-June 1964. No. 10.**

In this report residents of nursing and personal care homes are described by level of care given to them in terms of their health and related characteristics, and certain health services which they received.

The Resident Places Survey (RPS-2) of the nation's nursing and personal care homes determined which nursing or personal care services were being provided for the residents of these homes. These services were grouped into levels of care for the purpose of indicating the intensiveness of care a resident received.

A more intensive level of care was provided to groups of residents at the older ages, and women generally required a higher level of care than men.

As limitation of mobility increased, larger proportions of residents received some level of nursing care and conversely smaller proportions received personal care. The percents of groups of residents receiving some level of nursing care generally decreased as length of stay increased.

Fairly high levels of care were required for some specific chronic conditions such as cardiovascular conditions, rheumatism and arthritis and advanced senility.

Over two-thirds of the residents received some level of nursing care in homes in which either a registered nurse (RN) or licensed practical nurse (LPN) was the supervisory nurse compared with about two-fifths of the residents in homes in which neither an RN nor an LPN was supervisor. Homes with 24-hour-a-day nursing service provided higher levels of nursing care than homes which provided fewer hours of nursing service.

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According to geographic region, the South had the largest proportion of residents receiving nursing care (68 percent) and the West the lowest (52 percent). The South had the lowest proportions of residents receiving either personal care or none of the services.

The proportions of residents receiving a specific nursing or personal care service increased as the number of chronic conditions and impairments increased. This increase was generally found more often for the six personal care services than for the 13 nursing care services.

Of the 19 nursing or personal care services in which there were sex differentials, there was a preponderance of females over males at almost all age levels.

**129. 1968. Use of Special Aids in Homes for the Aged and Chronically Ill: United States - May-June 1964. No. 11.**

In this report residents of nursing and personal care homes are described in terms of the special aids they use. These aids — wheelchairs, eyeglasses, hearing aids, braces, crutches, artificial limbs and walkers — are discussed with such characteristics as age, sex, mobility status, type of service provided in the home, chronic diseases and impairments and length of stay.

An estimated 554,000 persons resided in nursing and personal care homes at the time of this survey. Excluding hearing aids and eyeglasses, about 71 percent of the residents used no special aids; however, with the inclusion of these, about 29 percent used no aids. A higher proportion of women than men used special aids (76 percent of the women and 63 percent of the men). The use of hearing aids, eyeglasses and walkers increased with age, whereas the use of wheelchairs remained fairly constant. The use of crutches, braces and artificial limbs, on the other hand, decreased in the older age groups.

Most of the residents (percent) were reported as having a chronic disease or impairment. Chronic diseases appeared to be the main cause leading to the use of walkers, crutches and wheelchairs. Braces were just as likely to be used by residents with impairments as by residents with chronic diseases.

Of the residents who used special aids of any kind, about 14 percent were restricted to their beds, 21 percent were restricted to their rooms and about 65 percent were unrestricted. Of those residents who used none of the special aids, approximately 23 percent were restricted to their beds, 20 percent to their rooms and almost 57 percent were unrestricted.

**130. 1969. Marital Status and Living Arrangements Before Admission to Nursing and Personal Care Homes: United States - May-June 1964 No. 12.**

In this report residents of nursing and personal care homes are described by marital status, living arrangements before admission and frequency of visitors in terms of their health and related characteristics and certain health services they received.

Data on which this report is based were collected in 1964 in the Resident Places Survey (RPS-2) of the nation's nursing and personal care homes. At the time of the survey there were an estimated 554,000 residents in 17,000 nursing and personal care homes.

In the same sense that nursing care homes provided more sophisticated types of health care than the other types of homes, married and widowed residents on a whole were receiving better care than residents in the other marital groups. Seventy-three percent of the married residents and 70 percent of the widowed were in nursing care homes compared with 64 percent of the divorced or separated and 58 percent of the never married.

A larger percent of residents who had lived with family or relatives or in hospitals prior to admission were in nursing care homes than residents of any other living arrangement group.

There was some difference by marital status in the rates for certain chronic conditions and impairments. The rank order of rates formed two distinct groups — those for the married and widowed and those for the divorced, separated or never married. For example, "other" mental disorders ranked as the most prevalent condition for the divorced, separated, or never married and sixth and ninth for the married and widowed.

For certain conditions such as vascular lesions and diseases of heart, there was little difference in the rank order of rates by previous living arrangements, while for advanced senility and "other" mental disorders there were large disparities. For example, "other" mental disorders ranked very high among residents who had come from a mental hospital or a long-term hospital and somewhat lower for those who had lived with spouse or children.

Married or widowed residents had more visitors than those residents who were divorced, separated or never married. Those who had previously lived with spouse and/or children were visited more often than residents from other living arrangement groups. Contrary to what might have been suspected, the older residents were visited more often.

**131. 1970. Arrangements for Physician Services to Residents in Nursing and Personal Care Homes: United States - May-June 1964. No. 13.**

In this report statistics are presented on arrangements made with physicians by the nation's estimated 17,400

nursing and personal care homes for the care of their 554,000 residents or patients.

These statistics are based on a 1964 survey in which personal interviews were conducted with the homes' administrators or other responsible staff.

The nursing and personal care homes are classified in this report by type of service, size, ownership, geographic region and extent of nursing coverage. Data for residents of the homes include sex, age, mobility status, number of chronic conditions, level of care and time last saw physician.

Four-fifths of the homes had made arrangements for visiting physicians, either to be called when needed (45 percent) or on a regular visiting schedule (36 percent). Few homes (4 percent) employed full-time physicians. About one-tenth of the homes had made no arrangements for physician coverage.

Proportionally more of the larger homes than smaller homes had full-time and regular-visiting physicians. Arrangements made for physician coverage were found to be associated with the primary type of service characterizing a home — a sequence from more to less intensive types of physician coverage was exhibited in the following order: geriatric hospitals, nursing care homes, personal care homes with nursing and personal care homes. Similarly, the sequence from more to less intensive physician coverage with regard to type of ownership was governmental, nonprofit and proprietary.

Homes with a full-time registered nurse in charge were most likely to have arrangements for full-time or regular-visiting physicians. Such physician coverage in homes without a full-time RN in charge was found in lesser but substantial proportions only where nursing service (by nurse or nurse's aide) was provided at all times.

Three-fifths of all residents were in homes that had full-time or regular-visiting physicians. Seven percent of all residents were in homes that had no arrangement for physician care.

#### Series 13:

##### 132. 1966. *Patients Discharged from Short-Stay Hospitals: United States -- October-December 1964*. No. 1.

This report presents some of the first statistical findings of the Hospital Discharge Survey of the civilian population in short-stay hospitals.

During the three months October-December 1964 an estimated 7,014,000 patients were discharged from short-stay hospitals in the United States. This represents an annual discharge rate of 148 patients per 1,000 noninstitutional population. Of these patients, approximately 97 percent were discharged alive.

One-fourth of the patients were discharged from hospitals having less than 100 beds; one-half were discharged from hospitals with less than 200 beds. Taken

as a group, the very largest hospitals discharged a relatively small proportion of patients.

The annual rate of discharge per 1,000 population was highest in the South (166), it was next highest in the West, where the annual rate was 163 per 1,000 population.

Two-thirds of the patients were discharged from voluntary, nonprofit hospitals. One-fourth were discharged from governmental hospitals, and nearly one-tenth from proprietary hospitals.

Slightly over 60 percent of discharged patients were female — a ratio of 1.6 females to each male. Exclusive of hospitalization for deliveries the sex ratio was 1.2 to 1.

The median age of discharged patients was 37 years. About 15 percent of the patients were under 15 years of age, 44 percent were in the age group 15-44 years, and nearly 17 percent were aged 65 years and over.

At time of discharge, 60 percent of the patients had but a single diagnosis, 23 percent of the patients had two diagnoses, and slightly less than 4 percent had five or more diagnoses. As a cause of morbidity, diseases of the digestive system ranked first among final diagnoses.

Of all the patients discharged, 54 percent emerged from their hospitalization episodes without surgery having been performed. One-third of the patients had had one operation, and 13 percent had had two or more.

The 7,014,000 discharges generated 53,908,000 patient days of stay during the three months. On an annual basis this represents 1,145 patient days per 1,000 average civilian, noninstitutional population.

About one-half of the patients were discharged in four days or less, although the average length of stay was 7.7 days. A stay of more than 30 days was experienced by three percent of the patients.

##### 133. 1967. *Utilization of Short-Stay Hospitals — Summary of Nonmedical Statistics: United States — 1965* No. 2.

It is estimated that about 25 million patients were discharged from short-stay hospitals during 1965. These patients received over 228 million days of care, which represents an average length of stay of 7.8 days. The estimated rates of hospital utilization were 153 discharges and 1,203 days of care for 1,000 persons.

Rates of hospital utilization were lowest for children of ages 1-14 years. Persons 65 years and over had higher rates than those of any other age group. In general, the rates of discharge and days of care, as well as the average length of stay, increased with advancing age for persons 15 years and older. The number of discharges per 1,000 persons 15-34 years of age is conspicuously high because of the large number of women in this age group who were obstetric patients.

The large number of obstetric admissions affects the hospital utilization statistics by sex and by marital

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status. Thus, the number of discharges per 1,000 persons was more than 40 percent larger for women than for men. The average length of stay, however, was higher for males (8.4 days) than for females (7.5 days). The discharge rate was about one-third larger for married than for unmarried persons, but the average length of stay was greater for unmarried persons.

The average duration of stay was about 6 days in proprietary hospitals and about 8 days in voluntary hospitals and in government-owned hospitals. The bed occupancy rate was higher for voluntary hospitals (82 percent) than for government and proprietary hospitals (69 percent).

The average length of stay increased with the size of the hospitals, ranging from about 6.7 days for hospitals with fewer than 200 beds to 12.6 days for hospitals with 1,000 beds or more. The bed occupancy rate was highest for hospitals of 200-499 beds and lower for the smaller and the larger hospitals.

The discharge rate was about 10 percent lower in the Northeast and the West than in the South and North Central, but the average length of stay was lower in the South and the West than in the other two regions. The bed occupancy rate was about 10 percent lower in the West than in the other regions.

**134. 1967. Utilization of Short-Stay Hospitals by Characteristics of Discharged Patients: United States - 1965. No. 3.**

An estimated 29.1 million patients were discharged from short-stay hospitals during 1965. The average length of stay was 7.8 days with nearly one-half of the patients being discharged in 4 days or less. The discharge rate was 153 per 1,000 persons. The average daily number of beds occupied per 100,000 persons, was about 330. Over 97 percent of the patients were discharged alive.

In general utilization rates were lowest and the average length of stay longest at the oldest ages. Utilization was proportionately greatest for persons 75 years and over. These persons had the highest discharge rate per 1,000 persons (333), had the longest average length of stay (14 days) and on the average occupied more beds daily (1,281) per 100,000 persons than any other age group.

Hospital utilization was proportionately lowest for persons 5-14 years of age. These persons had the lowest discharge rate per 1,000 persons (61), and occupied fewer beds daily (76) per 100,000 persons than any other age group. Furthermore persons aged 5-14 in addition to those aged 1-4 years had the shortest average lengths of stay (4.5 and 4.5 days).

The average length of stay for males was 8.4 days as compared with 7.5 days for females. However, both the discharge rate and the daily rate of hospital bed usage were markedly higher for females. The discharge rate for females was 181 per 1,000 persons as compared with a rate of 124 for males, females occupied an average of 371 beds daily per 100,000 females as compared with only 285 beds occupied per 100,000 males.

The discharge rates and the daily usage rates for females aged 15-44, the childbearing years, were more than double the comparable rates for males. For persons aged 15-34, the discharge rates for females were triple and the daily usage rates more than 2 1/3 times the comparable rates for males.

In contrast to the regular upward trend shown by the rates for males in ages above the 5-14 age group, the rates for females showed a secondary peak in the primary childbearing years of 15-34, followed by a decline, and then another peak at the oldest ages.

Unmarried persons aged 15 years and over had an average length of stay of 10.4 days as compared with only 7.6 days for married persons. This was due in part to the older age composition of unmarried persons who were hospitalized. Over 35 percent of the unmarried persons were aged 65 years and over as compared with about 13 percent of those married in that age group.

Proportionately fewer unmarried persons were discharged from short-stay hospitals, but proportionately more unmarried persons once they were hospitalized experienced longer lengths of stay.

The discharge status, which refers to whether the patient was discharged alive or dead, also varied with age. Starting with persons aged 35-44 years, the percent discharged alive decreased with advancing age. Virtually all persons 1 to 34 years of age were discharged alive. The percent discharged alive was lowest for persons aged 75 years and over (86 percent).

The average length of stay for persons discharged by death (14.7 days) was nearly double that for those discharged alive (7.6 days). In each age group, the average length of stay was greater for persons discharged by death than for those discharged alive. In both discharge status groups, the average length of stay was greatest for persons 65 years of age and older.

Males discharged by death had an average length of stay of 13.0 days as compared with an average of 8.2 days for males discharged alive. Females discharged by death had an average length of stay of 16.7 days as compared with an average of 7.3 days for females discharged alive.

**135. 1968. Patients Discharged from Short-Stay Hospitals by Size and Type of Ownership: United States - 1965. No. 4.**

In this report statistics are presented on short-stay hospitals and on patients discharged from these hospitals, according to size (determined by number of beds) and type of ownership of the hospital and to age, sex, color, marital status and discharge status of the patient.

Of the estimated 29.1 million patients discharged during 1965, 62 percent (18.2 million) were from hospitals with 100-499 beds. The smallest hospitals (those with less than 100 beds) accounted for 25 percent of the discharges, while the largest (those with 500 beds or more) accounted for nearly 13 percent. The average length of stay ranged from 6.6 days in hospitals with less than 100 beds to nearly 11 days in hospitals maintaining 500 beds or more.

In comparisons with other bed-size groups, proportionately more persons discharged from hospitals with 500 beds or more experienced longer lengths of stay. For example, over 40 percent of the patients in hospitals with 500 beds or more were hospitalized more than 7 days as compared with 31 percent in hospitals with 100-499 beds and 25 percent in hospitals with 6-99 beds. Over 11 percent of the patients in hospitals with 500 beds or more were hospitalized more than 21 days as compared with 6 percent in hospitals with 100-499 beds and 4 percent in hospitals with 6-99 beds. The longer lengths of stay for patients in hospitals with 500 beds or more were probably due in part to the severity of cases treated in these hospitals. In general, the larger hospitals have facilities that enable them to provide more definitive diagnostic and treatment services.

The proportion of patients with certain personal characteristics varied according to size of hospital. The proportion of unmarried persons and of persons discharged because of death were both higher in hospitals with 500 beds or more than in hospitals with 6-99 and 100-499 beds. The percent distribution of discharged patients by age and by sex within major bed-size groups showed little difference.

Voluntary nonprofit hospitals accounted for seven-tenths of all discharges from short-stay hospitals; government (primarily state and local) hospitals, two-tenths; and proprietary hospitals, one-tenth. The average length of stay for patients discharged from proprietary hospitals was six days compared with eight days for those discharged from voluntary nonprofit and government hospitals.

**136. 1969. *Regional Utilization of Short-Stay Hospitals: United States - 1965*. No. 5.**

In this report information concerning discharged patients, days of care and average length of stay is shown for the four major geographic regions, according to hospital characteristics and according to patient characteristics.

There were approximately 7,000 short-stay hospitals and 801,000 short-stay hospital beds in the United

States during 1965. More than one-third of the hospitals and almost one-third of the beds were in the South; these were larger proportions than those in any of the other regions. Patient discharges and days of care rendered were considerably more numerous in the North Central and South than in the Northeast and West. The average length of stay was highest in the Northeast and progressively lower in the North Central, South and West.

**137. 1970. *Inpatient Utilization of Short-Stay Hospitals by Diagnosis: United States - 1965* No. 6.**

The rate of discharge was higher for females and both males and females over 65. One out of every six admissions was for a delivery or complication of pregnancy. The percentage of admissions for pregnancy complications was higher for nonwhites than whites. Excluding obstetrical conditions, the single most frequently reported cause of inpatient admission was hypertrophy of tonsils and adenoids. The average length of stay varied by diagnosis, age and sex.

**Series 22:**

**138. 1968. *Visits for Medical and Dental Care During the Year Preceding Childbirth: United States - 1963 Births*. No. 4.**

In this report statistics are presented on the medical care received during the 12 months prior to childbirth by mothers who had liveborn babies in 1963. Estimates on the average number of visits to physicians and to medical facilities and the percentage who made their first visit during each 3-month period are given for all mothers. Estimates of the percentage who visited a dentist during the year are given only for mothers who had legitimate births.

These statistics are based on data collected in a mail survey with questionnaires sent to the mother, the attending physician, the hospital where the birth took place and to any other physician, dentist, hospital or other medical facility named by the first three sources. In cases where there was no response to three mailed questionnaires, followups by telephone or by personal interview were attempted.

The mothers about whom information is presented in this report are classified by age, number of live births, color, educational achievement, family income in 1962, geographic region and metropolitan status.

The mothers who had a liveborn child in 1963 made, on the average, 11.5 visits for medical care during the 12 months prior to the birth of the child. There was little variation by age of mother, geographic region or metropolitan status. Mothers made more visits for first births than for later births. The average number of visits was highest for white mothers and for mothers in high

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income or education classifications. Women in these categories also began their medical care earlier in the year than the average woman. Mothers of illegitimate babies made, on the average, fewer visits than mothers of legitimate babies in any educational or income class. Only 26 percent of the women reported having visited a dentist during the 12 months.

##### 139. 1968. *Medical X-ray Visits and Examinations During Pregnancy: United States - 1963*. No. 5.

In this report statistics are presented on the number of medical X-ray visits and examinations during pregnancy of women who had a live birth during 1963. Differences in the volume of medical X-ray care are shown by such demographic characteristics as color, age, income, geographic region and residence in metropolitan or nonmetropolitan areas. Other variables include type of medical facility, type of examination, trimester of examination and previous pregnancy experience. The data are based on a probability sample of 4,096 live births occurring in 1963.

About 900,000, or 23 percent, of the women giving birth in 1963 had 1,085,000 medical X-ray visits during pregnancy. A higher proportion of nonwhite mothers than white had medical X-ray visits; nonwhite females making visits showed greater variability by age than white females. The visit rate was 27 visits per 100 pregnant women.

Both visit rates and examination rates were higher for nonwhite females in each age group than for white. The greatest difference in visit rates was for mothers aged 25-29 years, and in examination rates it was for mothers aged 25-29 and 30-34 years. Mothers in the West had the highest visit and examination rates; those in the South and Northeast had the lowest. Mothers in metropolitan areas had higher visit and examination rates than those in nonmetropolitan areas. Both rates were fairly uniform in metropolitan areas by region, and quite variable in nonmetropolitan areas.

Almost 84 percent of the examinations reported during pregnancy were performed in such facilities as hospitals and clinics. The variation in type of facility according to type of examination shows that about one-fourth of the examinations of the uterus and pelvic region were performed in physicians' offices; one-third of these were performed by general practitioners and one-third by obstetricians and gynecologists.

About one-third of the examinations during the last trimester were for X-ray pelvimetry and 24 percent were examinations of the abdomen, which were related to pregnancy. Examinations during the first and second trimesters were predominantly of the chest. Rates for chest examinations were higher for nonwhite females

than for white; those for examinations of the abdomen were the same for white and nonwhite females, and for pelvimetry they were somewhat higher for white. The rate for pelvimetry was higher for primiparous than for multiparous women.

Rates for other examinations of the abdomen were somewhat higher at higher parities. At each parity the medical X-ray examination rate was significantly higher for women who had had a prior fetal loss. Most of the differences here relate to examinations of the abdomen.

X-ray examination rates generally do not appear to be related to income.

##### 140. Nikias, M. K., 1968. "Social class and the use of dental care under prepayment." *Med. Care* 6 (September-October): 381-393.

This study assessed the influence of the removal of the financial barrier on the use of dental care.

Administrative records of the Group Health Dental Insurance, Inc., a New York City dental prepayment plan, provided the data. For this study a 10 percent stratified cross-section sample of GHDI enrollees were chosen.

The utilization indices were 1) the number of persons using any services per 100 person-years; 2) tooth extractions (the percent of persons having at least one, the average number per patient and the number per 100 visits); 3) the percent who did not seek any dental service by length of time; and 4) the percent who obtained services every year.

Social class based on occupation was the correlate.

A cross-tabulation of percentage distributions was used to analyze the data.

Evidence overwhelmingly attested that for this sample of a prepaid dental plan membership the removal of the financial barrier through the prepayment mechanism did not significantly alter the utilization differentials among the different occupational groupings.

The higher the occupational level, the greater was the number of persons who sought any services during the year. In fact, there was a quantum-jump in utilization from the blue-collar to the white-collar occupations. Blue-collar workers also had a larger number of extractions proportionately than did the white-collar group.

More than half of the blue-collar workers had never gone to a dentist during a three-year period, compared with one-fourth of the white-collar workers.

Social class as measured by occupation was related to annual use rates more than to any other use pattern. The blue-collar workers were much less likely to manifest such preventive dental behavior than the white-collar group.

141. Nolan, R. L., et al. 1967. "Social class differences in utilization of pediatric services in a prepaid direct service medical care program." *Amer. J. Pub. Health* 57 (January): 34-47.

This study assessed the differences in utilization of services for children among families in different social classes in a prepaid medical care program.

Interviews with adults accompanying children enrolled in the Kaiser Foundation Health Plan, Oakland, California during four days of a survey in June, 1964 provided the data.

There were four indices 1) pediatric clinic visits (during the four days of the survey) by type of clinic — appointment or drop-in clinic or emergency room; 2) prior arrangement to see a doctor at a drop-in clinic; 3) the child's regular doctor; and 4) the time and day of the visit.

The correlates were patient characteristics (such as sex, age, social class and ethnic group) and reason for seeing the doctor.

The elimination of the financial barrier via prepayment for services did not appear to result in equality of utilization of services for white and nonwhite populations.

An equal proportion of female children visited the appointment and drop-in clinics, but a slightly higher proportion of males visited the drop-in clinics. Children 1-5 accounted for the largest percentage of children visiting the clinics.

Social Class I and III children were equally distributed between the two clinics, while more of the Social Class II children went to the appointment clinic. Most of the Social Class IV and V patients went to the drop-in clinics.

Whites regardless of social class divided their visits almost equally between the appointment and drop-in clinics while most Negroes visited the drop-in clinics. The upper social classes made greater use of preventive services and whites also had a smaller ratio of acute to preventive visits than did Negroes and Orientals.

There appeared to be no significant differences for social class and ethnic group relative to making prior arrangements to see the physician. Eighty-six percent of the whites had a regular pediatrician compared to 68 percent of the Negro children.

There were no significant ethnic or social class differences related to time of visit. Fifty-three percent of those who visited the drop-in clinics weekdays made evening visits. Of those who made daytime visits, 22 percent did not have a car available during the day.

142 O'Shea, R. M. and G. D. Bissell, 1969. "Dental services under Medicaid: the experience of Erie County, New York." *Amer. J. Pub. Health* 59 (May): 832-840.

This study described the impact of Medicaid on a population's utilization of dental services.

Fiscal records of recipients of Medicaid in Erie County, New York, during late 1967 and early 1968 provided the data.

The utilization index was dental services received based upon receipts for bills paid between November, 1967 and April, 1968.

The correlates were age and welfare status.

A cross-tabulation of percentage distributions was used to analyze the data.

The majority of Medicaid recipients were under 21, and most of these were of grade-school age or less.

Those on welfare received less care than the "medically indigent" who were also eligible for Medicaid. At least for this sample of Medicaid recipients, apparently those in the greatest financial need were less likely to visit the dentist than those enjoying a higher income.

143. Passman, M. J., 1966, "Hospital utilization by Blue Cross members in 1964 according to selected demographic and enrollment characteristics." *Inquiry* 3 (May): 82-89.

This study described the pattern of hospital utilization by Blue Cross enrollees.

Members' records of participation in 65 Blue Cross plans provided the data.

The utilization index was the length of inpatient hospital stay.

The correlates were age, sex, type of membership and census region.

A cross-tabulation of percentage distributions was used to analyze the data.

The average length of stay was greater for those over 65, for females, for individual subscribers (rather than members of a family plan), and for those members living in the Northeast.

144. Perrott, G. S., 1971. "The federal employees health benefits program: enrollment and utilization of health services — 1961-1968." Washington, D.C.: U.S. Govt. Printing Office.

This study compared utilization rates among the enrollees in the different insurance plan programs available through the Federal Employees Health Benefits Program.

Data available on enrollees through the Civil Service Commission and the Benefits Program records were analyzed.

The utilization index was hospital days per 1000 covered persons.

The correlate was the type of insurance plan such as Blue Cross-Blue Shield, indemnity, employee organization plans, comprehensive individual practice plans or comprehensive group practice plans.

Graphs were used to analyze the data.

This review of current statistics available on the Federal Employees Health Benefits Program suggests

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that group practice plans do indeed contribute to a reduction of inpatient hospital use.

A lower hospital utilization rate was in evidence for enrollees in the group practice plans with the individual practice plans running a close second. The group practice plans annual utilization, in fact, was consistently about one-half that of the Blue Cross and indemnity plans. Nonmaternity inpatient surgery experience trends revealed a similar pattern.

145. Peterson, M. L., 1971. "The first year in Columbia: assessments of low hospitalization rate and high office use." *Johns Hopkins Med. J.* 128 (January): 15-23.

This study assessed the impact of a prepaid group practice plan, the Columbia Medical Plan of Columbia, Maryland on outpatient and hospital utilization rates.

Encounter forms from Columbia Plan membership from November 1, 1969-April 30, 1970, the second through the seventh months of the Plan's operation, provided the data.

The utilization indices were physician office visits per person per year; hospital admissions per year per 1000 members; and hospital days per year per 1000 members.

The correlate was the experience of the membership of the Columbia Medical Plan compared to national averages.

A cross-tabulation of rates was used to analyze the data.

The early experience of the Columbia Medical Plan suggested that the prepayment mechanism encouraged seeking of ambulatory preventive services and decreased use of more expensive hospitalization alternatives.

Physician office visits per person per year were nearly twice the national average for a population of comparable income, age, sex and race — eight Columbia visits compared to 4.6 nationally. Forty percent of the visits at Columbia were for well-person care.

Hospital admissions per year per 1000 members were strikingly low when compared with national averages. As a rule of thumb from the national experience, one person out of eight will be hospitalized in a year. At Columbia one out of twenty were hospitalized.

Hospital days per year per 1000 members were 335 compared with 1000 days per 1000 population nationally. The average length of stay at Columbia was 6.6 days in contrast with a national figure of 8.4 days.

146. Picken, B. and G. Ireland, 1969. "Family patterns of medical care utilization: possible influences of family size, role and social class on illness behavior." *J. Chronic Dis.* 22 (August): 181-191.

This study described the effect of familial variables on medical care-seeking behavior.

Clinic records for patients of a general practitioner in a village near Edinburgh, Scotland provided the data.

The utilization index was a consultation index devised by dividing the observed yearly number of consultations by the mean yearly number of consultations for all persons of the same age and sex.

The correlates were social class, family size and family roles.

A Chi-square test of significance was employed to analyze the data.

The authors postulated that family patterns of medical care utilization were influenced not only by illness but also by the distribution of patterns of illness behavior determined by psycho-social factors operating within and through the family.

No significant relationship was observed between social class or family size and the level of consultations for fathers and mothers. Parents from upper social class with smaller families tended to consult the doctor about their children relatively more often than parents in other social class and family size categories.

Fathers and sons from larger families and from a lower social class showed significant similarities with regard to their level of consultations. Concordance for mothers and daughters was noted for the opposite family size and social class categories.

147. Podell, L., 1969. *Studies in the Use of Health Services by Families on Welfare: Utilization of Preventive Health Services (Supplementary Report)*. New York: The Center for the Study of Urban Problems, Bernard M. Baruch College, The City University of New York.

This study assessed the utilization of preventive health services by welfare families.

Interviews with a sample of 2179 female heads of households who were systematically drawn from the over 100,000 households receiving public assistance under family programs in April, 1966 in New York City provided the data.

There were three utilization measures: 1) the mother's use of preventive services (the percentage who engaged in selected preventive care behavior such as receiving medical, dental or gynecological exams, chest X-rays or polio vaccine; a preventive care index rating from 0-5 based on presence or absence of 5 selected health behaviors alone; and the percent of mothers with 2 or more preventive care utilizations); 2) maternity and prenatal care (the percentage that obtained prenatal care in the initial 3 months of pregnancy); and 3) health care of preschool children (the number of physician-child contacts by type of service such as doctor's office, home visits, outpatient clinic and emergency clinic; the

mean number of physician-child contacts and the percent of families with preschool children with over 6 physician-child contacts.

The correlates were race and ethnicity, age, outside interests, attitudes toward preventive care for preschool children, the mother's education, the state of the child's health and the state of the mother's health.

A cross-tabulation of percentage distributions was used to analyze the data.

White mothers in this population tended to make less use of preventive services than Negroes and Puerto Ricans. Women with more education and greater outside interests were likely to use more preventive care. Mothers who considered preventive care for preschool children important were likely to be high utilizers of preventive services themselves.

White mothers were more likely than the rest to have received prenatal care in the initial trimester of pregnancy. Delay appeared not to be related so much to the age of the mother but to the number of preschool children she had to care for at home.

Most contacts between physicians and preschool children occurred in clinics. Greater physician-child contacts were reported by Negro mothers, who were most likely to utilize outpatient clinics. White families were most likely of all to have physicians visit the home.

More physician-child contacts were reported by mothers with more schooling, mothers with poorer health themselves, mothers who viewed preventive care for preschool children as necessary and mothers who began their prenatal care early.

148. Pomeroy, R., et al., 1970. *Studies on the Use of Health Services by Families in Welfare: Utilization by Publicly-Assisted Families*. New York: The Center for the Study of Urban Problems, Bernard M. Baruch College. The City University of New York.

This study assessed the utilization of health services by welfare families.

Interviews with a sample of 2179 female heads of households, systematically drawn from the 100,000 households receiving public assistance under the family programs, in April, 1966 in New York City provided the data.

The utilization index was the total number of doctor-patient contacts reported by the respondents for the 12-month period preceding the interview (none, 1-2, 3-6, 7 or more).

There were five correlates: 1) social determinants (education, ethnicity, age and rural-urban residence); 2) health and illness (reported health - poor, fair, good; desire to stay in bed, children's reported health); 3) anxiety (worry, pain, fear of environmental response, frequent or no thoughts of death); 4) prevention and response (delay in seeing a doctor, attitude toward preventive care, number of preventive care activities; and

5) anti-medical beliefs (favor common sense or MD, confidence in drugs, confidence in prayer, attitudes toward sickness as punishment).

A Kruskal gamma was used to analyze the data.

Regardless of the other qualifying variables, the Negro subsample of mothers reported substantially higher total medical utilization than the Puerto Ricans or the whites. The latter reported the lowest overall utilization.

Total utilization was found to be highly related to health for all three ethnic subsamples. Those in poorer health consistently reported the highest use.

Worry and pain were related to utilization, but fear was not.

Further research is needed to examine the extent to which (assuming "health" and "illness" are held constant) preventive utilization serves to reduce the need for therapeutic utilization.

By and large, utilization was not related to anti-medical beliefs and attitudes.

149. Pope, C. R., et al., 1969. "Determinants of medical care utilization: the use of the telephone for reporting symptoms." *J. Health Soc. Behav.* 12 (June). 155-162.

This study assessed the effect of selected socio-demographic variables, social structural characteristics and health orientations on utilization of medical services in a prepaid group practice.

Medical records, interviews and incoming phone calls of a subsample of 100 families from the 5 percent overall utilization sample of the Kaiser Foundation Health Plan membership provided the data.

The utilization index was contact with a physician to report symptoms of new diseases, categorized as 1) regularly-scheduled visits, 2) walk-in or nonscheduled visits and 3) telephone contacts. Each of these three services was dichotomized as used or not used.

The correlates were socio-demographic variables (such as education, occupation, family income and perceived social class, dichotomized as low or high); social structure; and health orientation. For social structure the authors developed an index from answers to questions about 1) the extent of kinship interaction; 2) the nature of decision-making within the family; 3) homogeneity of friendship groups; and 4) geographic extent of friendships dichotomized as cosmopolitan or local.

For health orientation, indices were developed from questions relating to 1) dependency in illness; 2) disease knowledge; 3) skepticism of physicians' abilities; and 4) precise perception of the physician's role dichotomized as low or high.

A cross-tabulation of percentage distributions was used to analyze the data.

This study tested the general hypothesis that cosmopolitan persons with more scientific orientation are

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more likely to use the telephone for reporting symptoms of new diseases than the less cosmopolitan.

The findings lent some support to this hypothesis. However, the interaction of the socio-demographic and dependency-knowledge variables needs to be refined.

Generally speaking, those with higher education, occupations, income and perceived social class were relatively more likely to use the telephone for reporting symptoms and relatively less likely to use face-to-face contacts than those rated lower on the socio-demographic variables.

The indices of social structure and health orientation themselves did not appear to provide much support for the predicted hypothesis. While the more dependent and less-knowledgeable tended to use both walk-in and telephone services more, these tendencies did not become marked until they were combined with the socio-demographic correlates.

150. Purola, T., et al., 1968. *The Utilization of Medical Services and its Relationship to Morbidity, Health Resources and Social Factors*. Helsinki: Research Institute for Social Security.

This study examined the relationship of utilization to morbidity, health resources and other social factors for a Finnish population.

Interviews with a random sample of 6387 families surveyed in May-June 1964 provided the data.

The utilization indices were the number of consultations with a physician; the proportion of respondents who purchased nonprescription medicine; the proportion of respondents who purchased prescription medicines, the number of prescription medicines being used at the time of the interview; the number of days spent in hospital; and the number of visits by public health nurse.

The correlates were age, sex, place of residence, income, availability of care and morbidity.

A Chi-square test of significance, trend test, product-moment correlations and t-test were used to analyze the data.

Family income, distance to and availability of medical resources were found to be the main factors contributing to the hiatus between medical need and use of facilities.

Dependency between age and utilization of medical services was primarily due to increasing morbidity with age. In general, women used more medical services than men, though these differences were not due to morbidity differences, but were, in fact, accentuated when morbidity was controlled.

When the need for medical services was standardized the following relationships were observed.

Utilization of physicians' services increased with increasing level of income, with decreasing distance to the physician, and with increasing number of physicians available.

The number of prescription medicines being used decreased with increasing level of income.

The number of hospital days among the most sick increased with the increasing number of physicians available and increasing hospital beds owned by the community in which the respondent lived.

151. Rayner, J. F., 1970. "Socioeconomic status and factors influencing the dental health practices of mothers." *Amer. J. Pub. Health* 60 (July): 1250-1257.

This study assessed the influence of mothers' dental behaviors upon children's utilization of dentist services.

Interviews with the mothers of a random sample of 524 white children ages 11-14 in two school districts in suburban Buffalo, New York provided the data.

The utilization index was the frequency of dental visits.

The correlates were subjective social class and attitudes toward dental visits.

Path analysis was employed to analyze the data.

The author suggests that dental behaviors such as going to see the dentist and toothbrushing precede attitudes toward dental care, and that adult education programs should be designed to change behavior first, regardless of whether the desire to brush or visit the dentist is strong. Dental health behaviors are related to social class in that such practices become normative in those classes where dental health values are a part of the family life style, as in the middle and upper socioeconomic groups.

152. Reed, L. S. and W. Carr, 1968. "Utilization and cost of general hospital care: Canada and the United States, 1948-66." *Soc. Sec. Bulletin* 31 (November): 12-20.

This study compared the hospital utilization and cost experiences of the United States and Canada.

Analysis of data from *Hospitals Guide Issue* (U. S.) and *Hospital Statistics* (Canada) provided the data.

The utilization indices were admissions per 1000 population, days of care per 1000 population and the average length of stay (days per admission).

The correlates were U.S. non-federal general hospitals vs. Canada "public" general hospitals.

A cross-tabulation of rates was used to analyze the data.

Canada has a higher general hospital admission rate, a longer average length of stay, and more days of hospital

care per 1000 population than the United States.

Canada spends much more of its GNP for general hospital care. Though per diem costs are lower in Canada, per capita expenditures are higher there. From this data, these authors decided that it is difficult to draw any conclusions as to the relative success of the budget review process in Canada in controlling hospital costs.

153. Rein, M., 1969. "Social class and the utilization of medical care services: a study of British experience under the National Health Service." *Hospitals* 43 (July 1): 43-54.

This study assessed the utilization of medical services by the different social classes under the British National Health Service.

A secondary analysis of interviews during population surveys, physicians' records and hospital records provided data.

The utilization indices were annual physician consultation rates per 1000 population (i.e., the number of visits for all patients who consulted or the number of patients who visited a physician) and hospital admission rates and length of stay.

The correlate was social class.

A cross-tabulation of percentage distributions was used to analyze the data.

The author concluded that in England the lowest social classes make the greatest use of both physician and hospital services and that the quality of the care they receive is as good as that received by other social classes.

"The British experience suggests that the availability of universal, free-on-demand, comprehensive services along with a system of medical accountability by generalists, is a crucial factor in reducing class inequalities in the use of medical care services."

154. Richards, N.D., 1971. "Utilization of dental services." In Richards, N. D. and L. K. Cohen (eds.), *Social Sciences and Dentistry: A Critical Bibliography*. The Hague, Netherlands: Federation Dentaire Internationale.

This article is an excellent and inclusive review of the current literature on the utilization of dental services.

It identifies, reviews, analyzes and interprets survey research in the area of utilization of dental services. After a statement of some of the aims, pitfalls and limitations of utilization research, the literature is reviewed under three headings.

A number of national studies which have been undertaken in the United States are followed by a review of a number of local projects in the U.S. Although every effort has been made to consider utilization of dental services in the widest and international sense, it should be understood that outside of the U.S. relatively few

surveys have been reported. The second and third sections report utilization studies in England and Wales, and in other countries.

The final two sections of this paper are given to an analysis of the reasons for utilization (or more particularly of non-utilization) and to a statement of research needs in the future in this area. While some measures of utilization are available from government statistics, professional associations, and insurance corporations, these are not considered in any detail in this paper, which deals principally with survey data.

155. Richardson, A. and H. Freeman, 1969. "Use of extended health benefit program by octogenarian U.A.W. retirees." *Med. Care* 7 (May-June): 225-234.

This study examined the use patterns of aged enrollees in the U.A.W. Health Benefit Program for retirees.

Interviews with and medical records of a panel-study of male pensioners who were 80 years of age or older and enrolled in a U.A.W. program in Michigan provided the data.

The utilization index was a medical care typology based on those who received no medical care during the year, who had ambulatory care of 1 or 2 outpatient department physician visits, who had more than 2 ambulatory visits and those who were hospitalized less than 30 days or more than 30 days.

The correlates were the introduction of the U.A.W. program with new health benefits and social variables such as age, occupation, type of employment at retirement, education, living arrangement, marital status and mobility.

A cross-tabulation of percentage distributions was used to analyze the data.

The introduction of the new health benefits program led to an increase in the use of all types of care for the octogenarian retirees.

The findings further suggested the limited utility of the social variables as predictors of differences in use for this particular age group, in contrast to younger age categories.

156. Richardson, A. M., et al., 1967. "Use of medical resources by SPANCOS: II. Social factors and medical care experience." *Milbank Mem. Fund. Quart.* 45 (January): 61-75.

This study assesses the utilization experience of a group for whom the financial barriers to receiving medical care have been removed.

Data came from interviews with a sample of the 18,564 veterans of the Spanish-American War, Boxer Rebellion and Philippine Insurrection who were residing in the United States on February 1, 1964. Spancos may receive virtually all their care free from the V.A.

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The utilization index was a medical care typology based on no hospital or ambulatory care, one or two ambulatory visits, three or more ambulatory visits and hospitalization of 30 or less or 30 or more days.

The correlates were age, socio-economic status, family variables such as marital status, community and residential characteristics and ease of transportation to and distance from V.A. facilities.

A Chi-square test of significance was used to analyze the data.

The authors discussed the implications of their findings for providing free medical care to an aged population. They pointed out that age, family variables and community and residential characteristics evidenced little association with the rates of use. Access to the facility was, however, of importance. The Spancos living closest to the V.A. facility were the most extensive users. Those with lower socio-economic status were also more likely to use the V.A. facilities.

The authors suggest that the lower use of V.A. facilities by higher income Spancos may be attributable to three factors: their third-party coverage which enabled them to better afford non-V.A. facilities, the greater inconvenience of a large-scale V.A. organization and a reluctance to use what is free.

157. Richardson, W. C., 1970. "Measuring the urban poor's use of physicians' services in response to illness episodes." *Med. Care* 8 (March-April): 132-142.

This study assessed the responses of individuals in poverty areas to illness episodes as affected by severity of the condition, existence of third-party coverage, income and regular source of care.

Household interviews during a full area probability sample conducted by NORC in three low-income target areas of OEO neighborhood health centers provided the data. The neighborhoods were in Atlanta, Georgia and the Bedford-Stuyvesant-Crown Heights and Red Hook sections of Brooklyn, New York.

The utilization indices were measures of existence of an illness episode (based on whether the respondent had to withdraw from usual activity for at least two consecutive days because of illness or accident during the survey year) and response to the illness episode (based on factors such as lay consultation within or outside the household, physician consultation, location of the first doctor contact - emergency room, hospital or other clinic, doctor's office, home or telephone consultation - re-visits and hospitalization).

The correlates were 1) severity, either perceived (the respondent's perception of the seriousness of the condition) or physician-rated (the doctor's description of the

condition), 2) third-party coverage (Medicare, Medicaid, public assistance or other), 3) income (poor or not), and 4) regular source of care (private practitioner or clinic).

A cross-tabulation of percentage distributions was used to analyze the data.

This study significantly attests to the attenuation of income differentials in use of services when morbidity is serious and publicly-financed programs of medical care are available to the poor.

The effect of being poor on response behavior to illness episodes was greater for non-serious than for serious conditions. However, when the condition was rated serious and the individual had third-party coverage, the differences in consulting a physician were negligible.

Third-party coverage itself noticeably attenuated these income differences. For instance, the poor's use of physician services was actually higher in Brooklyn's Bedford-Crown and Red Hook sections, where a large percentage of the target population was covered by Medicaid and Medicare.

158. Richardson, W. C., 1969. "Poverty, illness and use of health services in the United States." *Hospitals* 43 (July 1): 34-40.

This study explored the relationship of poverty to health status and utilization of services.

Data came from a secondary analysis of National Center for Health Statistics survey data from 1963-1967.

The seven utilization indices were: 1) the time interval since the last physician visit; 2) the number of physician visits per year; 3) a percentage distribution of physician visits by place of visit (office, hospital, emergency room, telephone consultation or other); 4) selected physician utilization characteristics (such as the percent of preventive visits, the percentages of persons under 17 who had a routine physical exam and who visited a pediatrician and the percent of women who visited an obstetrician-gynecologist); 5) a percentage distribution of persons by the time interval since the last dental visit; 6) a percentage distribution of dental visits by type of service (such as fillings, extractions and other surgery and examinations and cleaning); and 7) discharges per 100 population from short-stay hospitals.

The correlates were family income, age and race.

The author stated that a substantial amount of evidence attested that the poor are sicker than other segments of the population but that they make less use of health services than do the non-poor.

The proportion of each income group that had a physician visit within the past year increased steadily as income increased.

For 1966 and 1967 the average number of physician visits per year for children under 5 showed the greatest

difference among income groupings, with 4.4 for families earning under \$3000 and 7.2 for those with \$10,000 or more annual income.

The differences in utilization by income and race were even more striking with the average of physician visits being much lower for nonwhites than for whites. Those in families with incomes under \$3000 were more than twice as likely as those in the highest income group to see the physician in a hospital clinic or emergency room and only half as likely to make contact with a doctor over the telephone.

A comparison of all visits occurring in the 1963-1964 period showed that 10.8 of the physician visits by families with incomes below \$2000 were for preventive services in contrast to 17.5 percent for those with family incomes over \$10,000.

Comparing the same two income groups, the percent of low-income children under 17 that had an exam within the year was 15.7; 53.9 percent of children in families in the highest income group reported a routine physical. Similarly, the high-income groups tended to make greater use of specialists such as pediatricians and obstetrician-gynecologists.

Income and racial differences with respect to dental care were larger than those found for physician services. The higher income groups, similarly, made greater use of preventive dental services. Relative to hospital utilization, the poor had higher admission rates and longer lengths of stay.

159. Robinson, G. C., *et al.*, 1969. "Use of a hospital emergency service by children and adolescents for primary care." *Canad. Med. Assoc. J.* 101 (November 1): 69-73.

This study assessed the utilization of emergency room services for non-urgent episodes.

Medical data, physician urgency ratings, and interviews with a one-third sample of the children and adolescents attending the emergency department of the Vancouver General Hospital during a 14-day study period provided the data.

The utilization index was an urgency rating for episodes of patients making use of ER facilities: emergent — requires *immediate* medical attention; urgent — requires medical attention within a few hours; and non-urgent — does not require emergency service.

The correlates were physician vs. parent urgency rating, distance from hospital and socio-economic status (occupation, education and ethnicity).

A Chi-square test of significance was used to analyze the data.

The trend to utilize the emergency room for other than accidents or emergency situations was confirmed.

The parent urgency rating was in all cases greater than that of the physician.

Those individuals who sought primary medical care for non-urgent or non-traumatic conditions resided close to the hospital and had lower ratings on the socio-economic indices than the remainder of the patients.

160. Rodman, A., 1965. "Comparison of Baltimore's utilization rates under two physician-payment systems." *Pub. Health Rep.* 80 (June). 476-480.

This study compared physician and hospital utilization rates in Baltimore before and after the change from a capitation plan to payment of a fee for each service under the Baltimore City Medical Care Program.

Interviews with a random sample of 1200 families a year (100 per month) were studied through the Baltimore Health Survey. Utilization data based on this sample was used for this study.

The utilization index was the number of visits per person per year to physicians and hospital clinics.

The correlate was the fee-for-service method of reimbursement for medical services to welfare recipients beginning January 1, 1963, since the previous method of capitation payment was not adequately reimbursing physicians for services rendered.

A cross-tabulation of percentage distributions was used to analyze the data.

Comparison of physician and hospital clinic utilization rates after the introduction of the fee-for-service payment, shows that physician utilization increased about 20 percent. Clinic utilization decreased 5 percent and total utilization increased about 9 percent. It appears that an actual increase of about 10 percent in visits for physicians occurred within the first year after the system was introduced.

161. Roemer, M. I., 1961. "Bed supply and hospital utilization." *Hospitals* 35 (November 1): 36-42.

This study assessed the impact of an increase in hospital beds on utilization.

Administrative records of hospital utilizers in an upstate New York county in 1957 and 1959 provided the data.

The utilization indices were the number of admissions, average length of stay and total patient days.

The correlate was the increase in supply of beds from 1957 to 1959.

A cross-tabulation of rates was used to analyze the data.

A sudden increase in the supply of beds in the county studied resulted in a prompt rise in the hospital admission rates and the average length of stay for most diagnoses. With widespread health insurance, says the author, the bed supply determines the hospital utilization rate through its influence on the practices of the physician. Physicians simply hospitalized their patients more frequently and for longer periods of time.

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162. Roemer, M. I., 1961. "Hospital utilization and the supply of physicians" *JAMA* 178 (December 9): 987-993.

This study examined the impact of physician supply on hospital utilization rates.

Analysis of data from sources such as the Health Information Foundation on utilization and physician supply in 48 states provided the data.

The utilization index was the number of general hospital admissions per 1000 per year, adjusted for insurance coverage and bed supply.

The correlate was the number of physicians per 100,000 population.

A cross-tabulation of ranks was used to analyze the data.

Below a threshold supply of 110 physicians per 100,000, the rate of hospital admissions tends to go up as the supply of physicians goes down. A possible explanation offered is that greater physician productivity would be permitted through the concentration of patients in the hospital. Rising hospital admission rates then simply may be due to the current shortage of physicians.

163. Roemer, M. I., 1958. "Influence of prepaid physician's services on hospital utilization." *Hospitals* 32 (October 16): 48-52.

This study assessed the impact of prepaid physician's services upon hospital use.

Administrative records of members of different hospital insurance schemes — prepaid and fee-for-service in Saskatchewan, Canada provided the data.

The utilization indices were cases admitted per 1000 persons per year and days of care per 1000 persons per year.

The correlates were prepayment or fee-for-service plans.

A cross-tabulation of rates was used to analyze the data.

Prepayment for physician's care tended to increase rather than decrease hospital utilization rates for this particular sample.

164. Roghmann, K. J. and R. J. Haggerty, 1970. "The utilization of child health services: distributions, patterns, and barriers." Unpublished manuscript. Rochester, New York: University of Rochester.

This study described some of the factors influencing children's utilization of health services.

Interviews during the 1967 Rochester Child Health Surveys provided the data.

The utilization indices were the frequency of doctor visits over specified time periods (two weeks, twelve months) and the time and place of most recent doctor visit (office, clinic, telephone).

The correlate was socio-economic class.

A cross-tabulation of percentage distributions was used to analyze the data.

Different patterns of use were in evidence for the two-week and twelve-month recall periods. There were fewer phone contacts for the twelve-month recall as this group is likely to be the preventive-service utilizers, who would require less immediate medical attention. The two-week recall group more often respond to acute conditions, requiring immediate attention via phone or office visit.

The higher socio-economic classes were more likely to make use of private physicians while the lower social classes used public clinics. Similarly, the lower class visits were primarily in response to illness episodes, while the upper class medical care seeking was more preventive in nature. Attitudes toward health and doctors and perceptions of barriers — whether real or imagined — were also found to be related to social class.

165. Roghmann, K. J., et al., 1970. "Anticipated and actual effects of Medicaid on the care pattern of children." Unpublished manuscript. Rochester, New York: University of Rochester.

This study assessed the impact of Medicaid upon achieving the stated goals of eliminating the differentials of access to, availability of, and quality of care.

Data came from interviews during three surveys. One was a special survey of 300 families selected from users of the Rochester, New York emergency room in March 1967. The other two were household surveys of random samples of the child population of Monroe County, New York, in 1967 and 1969.

The utilization indices were the private practitioner as regular source of care and as source of last immunization; the average number of medical contacts per year per person; the percent of preventive vs. illness-related visits; and the immunization status of children 1-5 years for DPT, smallpox, polio and measles.

The correlate was Medicaid enrollment or not.

Percentage distributions were used to analyze the data.

Survey data for 1967 showed that as a regular source of care 87 percent of those not on Medicaid in the 1-5 years range had a private practitioner compared to 36 percent of those enrolled in Medicaid. Another 46 percent had the outpatient department or health center for a regular source of care. Eighteen percent had no regular source of care.

Eighty-five percent of those not on Medicaid in 1-5 years of age range had a private doctor as place of immunization in 1967 compared with 29 percent enrolled in Medicaid.

In 1969, children in Blue Cross Plans had an average of 5.4 medical contacts per year, of which over 90 percent were by private practitioners compared with 3.7 medical contacts per year for Medicaid enrollees, of which 46 percent were by private practitioners.

In 1969, Medicaid enrolled children had 40 percent less preventive visits than Blue Cross registered children and about 20 percent less illness-related visits.

Though the immunization status for Medicaid enrolled children was not as good as non-Medicaid children, the use of such a preventive service showed an increase since Medicaid.

166. Roghmann, K. J., et al., 1970. "Child health services: volume and flow in a metropolitan community." Unpublished manuscript. Rochester, New York: University of Rochester.

This study assessed the motive for and pattern of child health services in a community.

Interviews during the 1967 Rochester Child Health Surveys provided the data.

The utilization variables were the frequency of doctor visits over specified time periods (two weeks, twelve months) and the time and place of most recent doctor visit (office, clinic, telephone).

The correlate was geographic location of patients stratified by social class.

A cross-tabulation of percentage distributions was used to analyze the data.

A larger proportion of the low socio-economic area residents had no doctor visit within the past year. Clinic visits were frequent for the lowest SES areas, while private doctor visits were more frequent for the higher SES residents. Some discrepancies due to the interaction of socio-economic factors and ecological idiosyncrasies were noted.

167. Rosenblatt, D. and E. Suchman 1964. "The underutilization of medical-care services by the blue-collarites." In Shostak, A. and W. Gomberg (eds.), *Blue-Collar World*. Englewood Cliffs, N.J.: Prentice-Hall.

This chapter described some of the factors which might account for the underutilization of medical services by the blue-collar population.

The authors cite several factors that might account for the blue-collar populations' underutilization of medical services in a metropolitan area. The elaborate patterning of medical services, little previous contact with medical professionals, less salience of the preventive care concept, lower educational levels, prejudice,

anomie, impersonality of bureaucracy were some of the factors cited.

In addition, several different models of medical care organization designed to accommodate the special needs of the blue-collarites were proposed by the authors.

168. Rosenstock, I. 1966. "Why people use health services." *Milbank Mem. Fund Quart.* 44 (July): 94-127.

In this article, Rosenstock formulated a social-psychological explanatory model for utilization of preventive health services.

Rosenstock points out the absence of empirical research explicitly testing this model and the methodological difficulties that are likely to arise in actually examining its explanatory utility.

The model hypothesizes that the decision to seek preventive care will not be made unless the following conditions are satisfied:

- 1) The individual is psychologically ready to take action relative to a particular health condition. The extent of readiness to act is defined by whether the individual feels susceptible to the condition in question and the extent to which its possible occurrence is viewed as having serious personal consequences.
- 2) The individual believes that the preventive behavior or test in question is both feasible and appropriate for him to use, would reduce either his perceived susceptibility to, or the perceived severity of, the health condition and no serious psychological barriers to the proposed action are present.
- 3) A cue or stimulus occurs to trigger the response.

169. Rosenstock, I. M., et al., 1959. "Why people fail to seek poliomyelitis vaccination." *Pub. Health Rep.* 74 (February): 98-103.

This article proposed an explanation for people's participation or failure to participate in the polio vaccine trials.

The authors suggest a model for explaining individuals' acceptance of the polio vaccine trials based on beliefs about susceptibility to poliomyelitis, about the severity of the disease, and about the vaccine's safety and effectiveness. They also posit that additional social pressure and convenience variables may be determinants of use.

170. Rosenthal, G. 1968. "Price elasticity of demand for short-term general hospital services." In Klarman, H. E. (ed.), *Empirical Studies in Health Economics*. Baltimore: The Johns Hopkins Press.

This chapter assessed the impact of pricing factors on the demand for hospital services.

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Clinical and administrative records of a stratified random sample of admissions to New England Hospitals in 1962 provided the data.

The utilization index was the length of hospital stay.

The correlates were cash outlay as percentage of the total bill, average daily room charge and the presenting medical condition.

A regression analysis was used to analyze the data.

The author suggested that, for most medical conditions, there is a significant price elasticity with respect to daily room charge, but not with respect to cash outlay as a percentage of the total bill. An explanation offered is that the patient is aware of the former assessment, but not of the latter until time of discharge. The author suggested that empirical evidence should provide incentives for testing many of the assumptions in the deductibles and co-insurance mechanisms.

See also:

Rosenthal, G., 1964. "The Demand for General Hospital Facilities." American Hospital Association Monograph, No. 14.

171. Rose, J.A. 1962. "Social class and medical care." *J. Health Hum. Behav.* 4 (Spring):35-40.

This study described the impact of social class upon medical care utilization.

Analysis of National Center for Health Statistics Survey Data, 1957-59, provided the data.

The utilization indices were the mean number of physician visits and the percentage distribution of physician visits according to type of service.

The correlates were education of head of household, family income, age and sex.

A cross-tabulation of percentage distributions was used to analyze the data.

Education and income are directly related to the use of physician services. This relationship held true within every one of the age-sex groups. Similarly, the type of service sought is directly related to education with the higher educational levels making greater use of preventive services. The relationship is similar, but not as clear-cut, for the different income categories.

The author posits several explanations for the prevailing relationship of social class indicators to use: 1) purchasing power differentials; 2) differing interpretations of illness; 3) different orientations toward treatment; and 4) knowledge and use of information differences.

172. Roth, J. A., 1971. "Utilization of the hospital emergency department." *J. Health Soc. Behav.* 12 (December): 312-320.

This study classified the referral sources for hospital emergency room users.

Observations on all days of the week and hours of the day and night at the emergency services in five hospitals in two parts of the country provided the data.

The utilization index was the number of cases visiting the emergency room in a specified time period.

The correlates were the urgency rating and the source of referral (self, professional or contract).

A cross-tabulation of percentage distributions was used to analyze the data.

A large proportion of the clientele of hospital emergency room were "regulars" — members of economically depressed groups, isolated from private medical practice, for whom the ER offered a convenient source of care for non-urgent conditions.

The categories of referral differed according to the type of hospital. The urban public hospital was typified by the self-referred patient. Professional referrals were prominent in proprietary hospitals. The contract case was found most frequently in the voluntary hospital with a medical school.

173. Salber, E. J., et al., 1971. "Utilization of services at a neighborhood health center." *Pediatrics* 47 (February): 415 - 423.

This study described the utilization patterns of registrants at a neighborhood health center.

Encounter forms for 1,889 children of 521 families registered over a five-month period at a neighborhood health center provided the data.

The utilization index was the mean number of encounters per child for pediatric, dental, nursing or other care.

The correlates were race, residence, age, AFDC status, education of mother and family size.

A cross tabulation of distributions was used to analyze the data.

After families were registered, variables such as race, residence, AFDC status, education of mother and family size had only minor effects on utilization of services at the center. The child's age markedly influenced utilization rates, with a greater proportion of preschool children than adolescents attending and attending more often. Visits to physicians and dentists were higher than national norms for corresponding ethnic and socio-economic groups.

The authors conclude that the response of residents to the health center was favorable and that "easy

accessibility, a reaching out philosophy, and genuine concern of the staff had its effect."

174. Schonfield, J., et al. 1963. "Medical attitudes and practices of parents toward a mass tuberculin testing program." Amer. J. Pub. Health 53 (May): 772-781.

This study assessed the characteristics that influence parents' permitting their children to participate in a TB screening test.

Interviews with 344 mothers of grade school children in Cambridge, Massachusetts, 1960 provided the data.

The utilization index was a typology of participation in a TB screening program based on participants, changers, untested refusals and tested refusals who had their own physician conduct the test.

The correlates were demographic characteristics such as sex; race; foreign-born grandparent; length of residence; Catholic or Protestant; age and education of mother; who makes decisions about health and illness procedures; reasons given for seeing or not seeing a physician; medical insurance coverage; knowledge about TB and diabetes; opinions about the TB screening program, fluoridation, and physicians; and family size.

A Chi-square test of significance was used to analyze the data.

No differences among the four groups were found for mother's age and education; grandparents' birthplaces; residence or child's sex, race and type of school attended. The tested refusals were found to come from the higher socio-economic groups and smaller families. They also were more knowledgeable about the disease and had more favorable attitudes toward physicians and less knowledge about TB and diabetes; also the fathers of these children were more often involved in the decision-making.

In contrast to both of the above groups, the participants and changers displayed a much more favorable attitude toward the screening program. In contrast to the untested refusals, they were much more knowledgeable about the disease and more favorably inclined toward physicians. The early participants had the most favorable attitude of any of the groups toward public preventive health measures such as fluoridation.

175. Shain, Max. 1968. "Hospital admission rates under Medicare and the former OAA medical program." Inquiry 5 (March):65-67.

This study compared hospital utilization rates under the Medicare and OAA programs in selected states.

Analysis of data from the Social Security Administration provided the data.

The utilization index was hospital admission rates per 1000 population.

The correlates were the OAA and Medicare programs. Graphs were used to analyze the data.

In general, in the 19 states examined, the hospitalization rate was lower under Medicare than under the OAA State Welfare programs. This difference was explained in terms of the differing compositions of the populations examined. The author believes that the hospital needs of the general aged population are lower than the OAA population who are likely to be older, more ill, and have a larger proportion of unemployed numbers than the general aged population.

176. Shain, M. and M. I. Roemer. 1959. "Hospital costs relate to supply of beds." Mod. Hosp. 92 (April): 71-73.

This study assessed the relationship of the supply of hospital beds to use.

Analysis of data from sources such as the Census, New York State Joint Hospital Survey and Planning Commission for 1957 provided the data.

The utilization indices were hospital days per 1000 population, hospital occupancy rate by percentage, and the ratio of actual to expected occupancy.

The correlate was beds per 1000 population.

Graphs and correlation techniques were used to analyze the data.

Findings indicated that the more hospital beds that are provided in a community, the more days of hospital care will be used. More than 70 percent of the differences in hospital utilization by state and county were associated with differences in bed supply.

There is no statistically significant relationship between the supply of beds and hospital occupancy rates. The authors conclude that in the United States general hospital beds are occupied at about the same rate, regardless of whether there are few or many beds per 1000 population.

177. Shanas, F., 1960. *Medical Care Among Those Aged 65 and Over*, Research Series No. 16. Center for Health Administration Studies. Chicago: University of Chicago Press.

This study described the illness and utilization characteristics of those age 65 and over.

Household interviews during a 1956 nationwide study by HIF and NORC provided the data.

The utilization indices were 1) physician (average number of physician visits per person per year, place of visit and time interval since last visit); 2) hospital (annual admission rate per 1000 persons); 3) home nursing care, and 4) special health appliances (eyeglasses, dental aids, hearing aids, special shoes, trusses).

The correlates were age, sex and degree of illness.

A cross-tabulation of percentage distributions was used to analyze the data.

The average sick older person had 13.7 out-of-hospital contacts with physicians in 1957, twice as many as the average well older person. Women reported more

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visits than men. Most older persons whether sick or well usually saw a doctor at his office. The very sick, particularly women, were more likely to see him in their homes, however. Six of every 10 older persons reported they had seen a doctor during the year preceding the interview. Among the sick group, about 8 in 10 had seen a doctor.

The hospital admission rates for the very sick were substantially higher than the rate for the older population as a whole.

Seven percent reported that they had some home nursing care in the 4 weeks preceding the interview. Twenty-one percent reported that they had to make some special arrangements in their way of life because of problems related to health. A higher proportion of the sick required such arrangements.

Almost all older people reported use of special health helps or appliances — usually glasses and prosthetic dental appliances. Less use of hearing aids, special shoes, trusses, canes or crutches, leg braces, wheelchairs and walkers was reported.

178. Shannon, G. W., *et al.*, 1969. "The concept of distance as a factor in accessibility and utilization of health care." *Med. Care Rev.* 26 (February): 143-161.

This article assessed the concept of distance and its relationship to health services utilization.

The authors present one of the most comprehensive and up-to-date reviews of the literature and the conceptual and methodological difficulties involved in operationalizing distance as a variable influencing the utilization of health services.

179. Shapiro, S., 1967. "Patterns of medical use by the indigent aged under two systems of medical care." *Amer. J. Pub. Health* 57 (May): 784-790.

This study assessed the utilization of health services by an aged population under a prepayment group practice plan and under the usual medical care system.

Data came from welfare records and HIP records of two groups. The first group was a 30 percent sample of participants enrolled in HIP and of the OAAs not enrolled. The second group was a 50 percent sample of patients of nursing homes.

The utilization indices were physician visits per person per year, days in hospital per person per year and the number of nursing home patients.

The correlates were Old Age Assistance enrollees who were members of HIP or not members.

Graphs were used to analyze the data.

Regardless of age, sex and welfare status, the HIP OAAs and non-HIP-OAAs were very similar in all but

one of the social characteristics examined, place of birth. A far greater proportion of the HIP-OAAs were from Puerto Rico or Latin America. A smaller proportion of HIP-OAAs were from Eastern Europe than the non-HIP-OAAs.

With the introduction and enrollment of OAA recipients in the HIP experimental programs, the following shifts in utilization were evidenced for those enrolled and those not enrolled in the program:

- 1) The proportion of HIP-OAAs who received no ambulatory care went down while the corresponding proportion of the non-HIP-OAAs remained unchanged.
- 2) In HIP, 81 percent of the visits were to the doctor's office, compared with 42 percent for the non-HIP.
- 3) Low-utilizer groups (e.g., Puerto Ricans) saw doctors more often if they were enrolled in HIP during the study year than those who were not.
- 4) High-utilizers in the pre-demonstration period continued to obtain large volumes of care, but they averaged fewer doctor visits in HIP than before.
- 5) HIP-OAAs were more likely than non-HIP-OAAs to receive ancillary services such as podiatry and optical care.
- 6) Nursing home patients showed no change in physician or hospital utilization rates; however, laboratory services were far more frequently used, perhaps reflecting a positive shift in the quality of care rendered OAA-recipients under HIP.

There appeared to be significant shifts in the utilization patterns of the OAA population subject to enrollment in a health delivery mechanism, such as HIP of New York.

180. Shapiro, S. and J. Brindle, 1969. "Serving Medicaid eligibles." *Amer. J. Pub. Health* 59 (April): 635-641.

This study described the experience of HIP in New York City with Medicaid enrollees.

HIP medical and administrative records of the 74,000 Medicaid enrollees out of the 772,000 HIP enrollees provided the data.

The utilization indices were physician services per 100 persons per year and out-of-hospital or in-hospital place of service.

The correlate was Medicaid enrollment or not.

A cross-tabulation of percentages was used to analyze the data.

Physician utilization rates were substantially lower for Medicaid enrollees than for non-Medicaid enrollees.

In-hospital and out-of-hospital rates were also less for Medicaid enrollees. In-hospital rates were probably

affected by bed shortages. Out-of-hospital rates were affected by the use of municipal hospitals instead of such facilities as nursing homes.

181. Sills, D. L. and R. E. Gill, 1958. "Young adults' use of the Salk vaccine." *Soc. Prob.* 6 (Winter): 246-253.

This study assessed the characteristics of some participants in the Salk poliomyelitis vaccine trials.

Interviews during a national survey in 1957 provided the data.

The utilization index was the percent who were vaccinated for polio.

The correlates were socio-economic status, the avowed reason for being vaccinated, concern over polio and the behavior of the respondent's friends toward vaccination.

A Chi-square test of significance was used to analyze the data.

Vaccination was clearly related to socio-economic status with a higher percent of those vaccinated in the upper status categories and a lower percent in the lower groups.

However, the vaccination rate among those who said their friends were vaccinated was much higher than those who said their friends were not vaccinated. The authors concluded that this friendship factor was even more important than SES in determining vaccination behavior.

182. Solon, J.A., et al., 1969. "Episodes of medical care: nursing students' use of medical services." *Amer. J. Pub. Health* 59 (June): 936-946.

This article offers a framework for analyzing utilization behavior in terms of an episode of medical care.

An episode was defined as a sequence of "one or more medical services received by an individual during a period of relatively continuous contact with one or more providers of service in relation to a particular medical problem or situation." Consideration of the episode of care as the unit of analysis permitted identification of the patterning of medical care visits which examination of simple indices of volume does not permit.

183. Solon, J. A., 1966. "Patterns of medical care: sociocultural variations among a hospital's outpatients." *Amer. J. Pub. Health* 55 (June): 884-894.

This study described the socio-cultural characteristics of users of a hospital's outpatient department.

Medical records of and interviews with a stratified random sample of 667 persons using the outpatient clinics of Beth Israel Hospital, Boston, during a 3-month period of 1958 provided the data.

The utilization index was use of the outpatient facilities of the hospital during the study period.

The correlates were age, sex, central source of care, occupation and ethnicity. Ethnicity was described as white, non-Jewish (American-rooted in the second generation) or Jewish (second generation or East European immigrant).

A cross-tabulation of percentage distributions and graphs were used to analyze the data.

There was a discernible pattern of the use of the outpatient hospital facilities by age, sex, occupation and ethnicity.

The proportion of outpatients under 65 who centered their care in a private doctor declined progressively with age. Among those 65 and over, a significantly higher proportion made use of the hospital as their central source of care.

The only variation in this somewhat linear patterning was in the 15-44 year-old category. For this age group the hospital and private physician shared equally as a central source of care. In all adult age levels, women were more likely than men to have a central source of care.

A larger proportion of the lower occupational categories, such as the retired, housewives and service workers, made exclusive use of the outpatient clinics for all general and specialty care than those in the higher occupational groups.

Measured by a visit to the outpatient department in at least six of the last 12 months, the proportion using the OPD exclusively increased steadily upward from the American-rooted to the East-European.

See also:

Solon, J. A., et al., 1960. "Delineating patterns of medical care." *Amer. J. Pub. Health* 50 (August): 1105-1113.  
and

Solon, J. A., et al., 1960. "Patterns of medical care: a hospitals' outpatients." *Amer. J. Pub. Health* 50 (December): 1905-1913.

184. Somers, H. M. and A. R. Somers, 1961. *Doctors, Patients, and Health Insurance*. Washington, D.C.: The Brookings Institute.

This book is one of the classic descriptions of the organization and financing of medical care in the United States.

Chapter 9, "Changing Patterns of Utilization," is the section which most explicitly reviews utilization trends. The authors point out such factors as the emergence of the hospital as the "physician's workshop" effecting an increased use of hospital services; the increasing supply of available beds; the increased longevity of the population and the growth of the health insurance industry.

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185. Sparer, G. and L. Okada, 1971. "Differential patterns of poverty and health care utilization in eight urban areas." Paper presented at the meetings of the American Association for Public Opinion Research, Pasadena, California (May 22, 1971).

This study proposed the use of small-area data from OEO-assisted low-income neighborhoods to serve as a baseline for comparing health care utilization.

A NORC survey of a standard area probability sample of eight OEO-assisted neighborhood Health Center service areas in 1968 and in 1969 provided the data. The eight communities were Bedford-Crown, New York City; Red Hook, New York City; Southeast Philadelphia; Upper Cardoza, Washington, D.C.; Southside, Atlanta; Peninsular, Charleston; Mission, San Francisco; and East Palo Alto.

The utilization indices were physician, hospital and dentist utilization. The physician components were the percentages of those who reported a private physician and/or private clinic as the regular source of care, no usual source of care, five or more doctor visits in the past year and no doctor visits in the past year.

The hospital components were the average number of hospital days per person per year and the percent who reported a hospital admission in the past year.

The dentist components were the percent who reported no dental visit in the past year, the average number of dental visits in the past year per person, the percent of the population who received preventive dental care in the past 12 months and the rates for restorative care and extractions.

Each of the survey areas was described in terms of poverty density, welfare coverage, Medicaid coverage, the percent who reported chronic conditions with activity limitation and income.

A cross-tabulation of percentage distributions was used to analyze the data.

In general, evidence indicated that the poor in low-income areas had a greater incidence of chronic conditions and required greater use of physician and hospital services.

Relative to physician utilization, other findings were:

- 1) Those areas considered richer in medical resources and higher in Medicaid coverage tended to make greater use of private sources of care.
- 2) Over 85 percent in all areas and in all income categories reported a usual source of care. Those areas which reported the largest number of those with no usual source of care also had lower chronic illness rates. Low-income well persons were less likely to have any usual source of care.
- 3) There appeared to be no distinctive relationship of physician visits to income. However, the welfare

category had the highest number of five-or-more doctor visits because of the higher proportion of chronic conditions of those on welfare. Southern areas showed lower physician use unrelated to a chronic condition.

- 4) Having had no physician visits showed no regular pattern by income.

Findings relative to hospital utilization showed that the lower the income, the lower was the average number of hospital days per person per year and admission rate.

Findings relative to dentist use were:

- 1) The percent in all areas surveyed who reported no dental visit in the past year was much higher than the national average.
- 2) The average number of dental visits per person per year for most areas was less than the national average.
- 3) There was a direct relationship between preventive dental care and income.
- 4) Most areas showed a low ratio of restorative care to extractions.

186. Stine, O., et al., 1968. "Broken appointments at a comprehensive child clinic for children." *Med. Care* 6 (July-August):332-339.

This study identified factors that contributed to broken appointments at a comprehensive clinic for children.

Interviews with 203 low-income Negro families enrolled in the Maternal and Child Health Clinic at Johns Hopkins University provided the data.

The utilization index was the level of appointment breaking.

The correlates were the mothers' education, the fathers' social activities, rural or urban origins of the mothers, attitudes of the mothers toward their husbands and reaction of the mothers toward children's misbehavior.

An analysis of variance was employed on the data.

A mother's education was the most important variable in these findings. Those with less than a high school education were more likely to break appointments.

187. Strauss, M. A. and G. Sparer, 1971. "Basic utilization experience of OEO comprehensive health service projects." *Inquiry* 8 (December): 36-49.

This study described the utilization experience of participants in the OEO Comprehensive Health Services project.

CHS program records from eight OEO-CHS projects provided the data.

The utilization index was the number of M.D. and R.N. or P.H.N. encounters at the clinic per year.

The correlates were the participants' registration status identified as 1) registrant (an individual, with an estimated residency of at least one year in the clinic area, who went through the registration process for the clinic); 2) active registrant (an individual with an estimated residency of at least one year who had at least one service in the clinic during an 18-month period), and 3) user (an individual with an estimated residency of at least one year who had at least one service in the clinic in a one-year period).

A cross-tabulation of percentage distributions was used to analyze the data.

The concept of active registrant was found to be a useful denominator for utilization rates. These studies of OEO-assisted projects were characterized generally by relatively high utilization rate for users and active registrants. The rates for registrants were comparable to the national averages for all persons.

The authors suggest these findings imply adequate accessibility of medical service in these OEO communities. Patients newly-registered in the projects utilize services at a higher rate initially than later during their enrollment, suggesting that new registrants are likely to have conditions requiring prompt medical attention.

188. Suchman, E., 1965. "Social patterns of illness and medical care." *J. Health Hum. Behav.* 6 (Spring): 2-16.

This is a classic presentation of cosmopolitan and parochial differentials in orientation toward medical care.

Interviews with a representative, stratified, two-stage, cluster sample of adults 21 years old and older living in the Washington Heights community of New York City provided the data.

The dependent variables were measures of individual medical orientation and response, identified as scientific (an objective, formal, professional, and independent approach to illness and medical care) and parochial (a subjective, informal, lay, dependent approach).

The independent variables were group structure identifications, demographic factors and health status. A cosmopolitan group structure was a progressive, instrumental, individualistic and open social group. A parochial group was traditional, affectual, shared and closed.

A cross-tabulation of percentage distributions was used to analyze the data.

The author's findings suggest that demographic characteristics such as social class, sex and age and social group structure contribute independently to medical orientation. Group structure was not found to be related to health status, "though health status was related independently to medical orientation."

The author suggests that scientific and popular orientations toward medical care result in two qualitatively distinct kinds of medical care behaviors. He posits

a model summarizing the social and medical inputs to medical care orientation and the effect of this orientation on medical care behavior.

189. Suchman, E., 1965. "Stages of illness and medical care." *J. Health Hum. Behav.* 6 (Fall): 114-128.

This article analyzes and describes five stages involved in seeking medical care.

Interviews with an area probability sample of 5,430 persons from 2,215 families in the Washington Heights community of New York City provided the data. Adults 21 years old and older whose illnesses required three or more physician visits and incapacitated the individual five or more consecutive days or required one or more days of hospitalization were chosen for this survey.

Five stages of illness were defined as 1) symptom experience, 2) assumption of sick role, 3) medical care contact, 4) dependent-patient role and 5) recovery or rehabilitation.

Besides providing a conceptualization of some relevant correlates of medical care seeking, the article listed these findings for the different stages of illness:

1) The severity of the symptoms was an important factor in an individual's decision to seek care. In the case of chronic illness, the insidious nature of the onset of illness may have caused delay.

2) Discussion with family and friends is very important in providing an individual "provisional validation" to relinquish his normal role and seek professional advice.

3) People experiencing alarming symptoms did not delay in contacting a doctor. This stage is fairly routinized and offered little difficulty to the patient.

4) Individuals sometimes needed assistance to assume the dependent-patient role.

5) Relinquishing the sick role appeared to provide most people with less difficulty than assuming it.

190. Tyroler, H., et al. (Part I), 1965. "Patterns of preventive health behavior in populations." *J. Health Hum. Behav.* 6 (Fall): 128-140.

Tyroler, H., et al. (Part II), 1965. "Patterns of preventive health behavior in populations." *J. Health Hum. Behav.* 6 (Fall): 128-140.

#### Part I

This study examined the factors influencing families' acceptance of poliomyelitis vaccine.

Interviews with a probability sample of intact nuclear family members with one preschool child in Dade County, Florida provided the data.

The utilization index was a measurement of family patterns of immunization for polio, based on whether or not the mother, father and/or child received the vaccine.

A Chi-square test of significance and correlation coefficients were used to analyze the data.

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Maternal decision was the determinant of immunization patterns within the families. The direction of the effect of maternal decision-making, however, was different for different classes. There was frequently a high degree of immunization in the high social classes but no immunization in the lower classes. This was due to the lower acceptance of immunization by fathers in the lower social classes and produced a higher proportion of families in the lower classes with none of the members vaccinated.

### Part II

This study examined the factors influencing families' carious tooth salvage patterns.

Interviews during a state-wide survey of intact nuclear families with at least one child in North Carolina provided the data.

The utilization index was a measurement of the patterns of a families' carious tooth salvage based on the number of filled teeth divided by the number of teeth attacked by caries.

Social class and ethnicity were the correlates.

A Chi-square test of significance and graphs were used to analyze the data.

The levels of family tooth salvage were lowest for the non-white, somewhat higher for white lower social class groups and highest for white upper social class families

As with the Dade county study of polio vaccination, the maternal influence in family preventive behavior was noted within each family group.

191. U.S. Public Health Service, 1959. *Dental Care in a Group Purchase Plan: A Survey of Attitudes and Utilization in the St. Louis Labor Health Institute*. PHS No. 684. Washington, D.C.: U.S. Govt. Printing Office.

This study described the dental utilization patterns of the members of a prepaid group practice plan.

Interviews and membership records of a systematic random sample of the members of the St. Louis Labor Health Institute provided the data.

The utilization indices were the number of clinic visits and the percent of the total dental visits at the LHI clinic.

The correlates were family size, age, sex, education, income, and race.

A cross-tabulation of percentage distributions was used to analyze the data.

Services of the program were underutilized. Two reasons given were difficulty in getting appointments and inability to get off work to see the dentist.

Other findings revealed:

1) The larger the family, the greater was the likelihood that family members sought care during the year and that care was sought at the LHI clinic.

2) School children and young adults visited the dentist most often.

3) Women were more likely to receive dental care both at LHI and outside.

4) The higher the education, the higher was the use of the clinic.

5) Income exerted some influence on utilization even though complete dental services were available cost free.

6) Blacks received less care than whites. Most of their care was received at the LHI clinic and was more frequently of emergency nature.

192. U.S. Public Health Service, 1960. *Population Characteristics and Participation in the Poliomyelitis Vaccination Program*. PHS No. 723. Washington, D.C.: U.S. Govt. Printing Office.

This study described the characteristics of the population participating in the polio vaccine trials.

Interviews with a national sample of people in 35,000 households sponsored by PHS provided the data.

The utilization index was the percent of persons who participated in the trials.

The correlates were age, sex, geographic region, family income and race.

A cross-tabulation of percentage distributions and graphs were used to analyze the data.

Findings reveal that:

1) Participation was highest among those 1-19 years of age, and especially 5-14.

2) Females were more likely to be vaccinated than males.

3) The proportion receiving one shot was somewhat lower in the South and in areas outside SMSAs.

4) The number of shots received was directly related to income.

5) Blacks were less likely to have participated than whites.

193. U.S. Public Health Service, 1969. *Proceedings of a Conference on Conceptual Issues in the Analysis of Medical Care Utilization Behavior*. Conference sponsored by Kaiser Foundation Hospitals and National Center for Health Services Research and Development. Portland, Oregon (October, 1969).

This summary of three main papers at this conference appraised some of the major conceptual and methodological issues in medical care utilization.

These papers were:

"The Measurement of Medical Care Utilization," by Raymond Fink.

"The Classification of Disease," by H. A. Tyroler.

"The Selection of Statistical Technique," by Jay H. Glasser.

Fink summarized some general issues in both utilization measurement and the relationship of disease and illness, consumer health behavior and medical service delivery to utilization.

Utilization measurement, he said, is concerned with sources of data (medical charts, control records, personal interviews), appropriate denominators for utilization data (utilizers or population-at-risk), and the components of medical services (providers, place, amount of time spent).

On the relationship of disease and illness to utilization, Fink raised questions about why some conditions may not be reported, the stage of illness at which a patient seeks care and the nature of the treatment that follows. Measurements of consumer health behavior, Fink emphasized, need more refined indices than "participants vs. non-participants" to assess program effectiveness. For example, he suggested some measurement of the amount of effort required to get people to participate.

The use of different sources of care is also a critical variable in studying delivery system effectiveness, he said. The family as a unit of medical care behavior for utilization analysis should be given greater attention.

He stated that those concerned with the delivery of medical services should direct more attention to the components of medical care utilization, to the relationship of need to use, to the availability of treatment services, to the measurement of change in utilization behavior and to the measurement of utilization differences in different health care systems.

Tyroler discussed the classifications of disease developing for purposes other than health services utilization which are not likely to be the most useful and effective for analyzing utilization behavior. Both the population's and the provider's perspective should be incorporated in the classification system. Characteristics of the classification scheme would then differ according to whether the analysis is of health, sickness or patient behavior.

Glasser provided an overview of the major statistical techniques commonly employed in utilization studies such as index construction, AID, correlation and probability models. He argued for their further refinement and for the training of professionals to use these techniques.

194. U.S. Public Health Service, 1958. *Public Participation in Medical Screening Programs: A Socio-Psychological Study*. PHS No. 572. Washington, D.C.: U.S. Govt. Printing Office.

This study assessed factors that prompted participation in medical screening programs.

Interviews with a random sample of 1201 persons in three cities (Boston, Cleveland and Detroit) provided the data.

The utilization index was the percent who had one or more voluntary chest X-rays.

The correlate was a social-psychological model of readiness.

Graphs were used to analyze the data.

The author explained that whether, where and when to obtain chest X-rays depended on the interaction of these three sets of factors:

1) A psychological state of readiness based on beliefs that the individual might contact TB, could have TB, and not know it and would benefit from early detection of TB.

2) Situational influences symptoms of TB and influences exerted toward or away from X-ray screening such as social pressure or medical advice.

3) Environmental conditions based on the opportunity to obtain an X-ray and minimal amounts of lost time and expense.

The author concluded that variations in these three relevant factors accounted for participation in the X-ray screening program.

195. Watkins, E., 1968. "Low-income Negro mothers — their decision to seek prenatal care." Amer. J. Pub. Health 58 (April):655-667.

This study assessed factors that influence mothers to seek prenatal care.

A systematic sample of 120 married Negro women in assorted stages of pregnancy, who had at least one other child, chosen from the total clinic population at Boston City Hospital between April 6 and August 7, 1964 provided the data.

The utilization index was early initial contact for prenatal care (before the 19th week) or late initiation.

The correlates were socio-economic characteristics of the women and their husbands; their attitudes toward the pregnancy; impressions of previous pregnancies; impressions of previous experience with prenatal care and the way in which decision to seek care was made.

A Chi-square test of significance was performed on the data.

Early initiators were younger, of lower gravidity and had longer intervals between recent pregnancies. A high proportion of early initiators had positive attitudes toward their pregnancies. But women who sought care early also gave histories of high rate of fetal loss, prematurity and infant deaths.

However, both early and late initiators tended to see prenatal care as a treatment for acute symptoms. The major difference between the two groups was that early initiators were more likely to have felt sick in the early months of pregnancy.

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196. Weiss, J. E. and M. R. Greenlick, 1970. "Determinants of medical care utilization: the effect of social class and distance on contacts with the medical care system." *Med. Care* 8 (November-December): 456-462.

This study analyzed the impact of social class and distance on the utilization of health services.

Medical, administrative and telephone-contact records of a sample (3106 individuals) of the Kaiser Foundation Health Plan membership who live within 20 miles of the nearest Kaiser clinic provided the data.

The utilization index was the initial contact for a particular morbidity, classified as walk-in visit, regularly scheduled visit, telephone contact or emergency room contact. The contacts were standardized by age and type of contact per 100 subscribers.

The correlates were middle or working class and distance. Distance in miles was measured along the most likely route from the center of the census tract in which the patient's residence was located to the nearest Kaiser facility.

A cross-tabulation of frequencies was used to analyze the data.

The authors demonstrated that distance and social class interacted in the initiation of contact with the medical care system.

The major pattern which emerged from this study was the tendency for middle class persons who lived 15-20 miles from the clinic to use fewer regularly scheduled appointments and more telephone contacts than other middle class persons who lived closer to the facility.

The working class population who lived 15-20 miles from the facility tended also to use fewer regularly scheduled contacts, but appeared to use emergency room contacts rather than telephone calls.

197. Weiss, J. E. et al., 1971. "Determinants of medical care utilization: the impact of spatial factors." *Inquiry* 8 (December): 50-57.

This study analyzed the effect of distance between patient and provider on the utilization of physician services in a metropolitan area.

Medical and administrative records of a sample of the Kaiser Foundation Health Plan membership provided the data.

The utilization index was the number of physician office visits by specialty during clinic hours.

The correlates were distance, organizational variables, disease, and demographic factors. Distance was determined by measuring in miles the most likely travel route from the center of the census tract in which the patient's residence was located to each of the three outpatient

clinics studied. The organizational variables considered the three clinics and the specialties available at each. Disease was chronic, acute, symptomatic or requiring hospitalization. The demographic factors were sex, occupation (blue- or white-collar) and age.

A cross-tabulation of percentage distributions was used to analyze the data.

The authors conclude that "when a diverse population shares a common source of medical care, travel distance becomes a relatively important variable in the overall utilization patterns of the population."

Sixty-four percent of all physician visits were made to the nearest facility. However, the type of specialty available at the nearest clinic significantly influenced travel to the clinic. More people traveled farther to Central Clinic where more of the specialists and resources were located.

Thus people requiring the services of obstetricians, gynecologists and surgeons traveled farther than people requiring the services of pediatricians and internists who were available on a full-time basis at each of the clinics.

To control for this different availability of physicians, travel patterns for visits to pediatricians and internists were analyzed separately. When measured in this way, 70 percent of all visits were made to the nearest clinic.

Disease, occupational status, age and sex appeared to have little effect on travel patterns.

198. White, E. L. 1968. "A graphic presentation on age and income differentials in selected aspects of morbidity, disability, and utilization of health services." *Inquiry* 5 (March): 18-30.

This study assessed the differential morbidity, disability and utilization patterns of different age groupings and social classes.

A secondary analysis of National Center for Health Statistics survey data, 1964-1967 provided the data.

The utilization index was physician, dentist and hospital use and insurance coverage. Physician use (based on figures for fiscal year 1964) was the percent of the population with physician visits in the past year, the percent of the physician visits for preventive services, the distribution of physician visits by place (office, outpatient clinic, home, telephone consultation or other) and the percent of persons under 17 who had a routine physical exam in the past year.

Dentist use was the number of dentist visits per person per year (based on 1964 figures).

Hospital use was the number of discharges from short-stay hospitals per 100 persons (based on figures for fiscal years 1966 and 1967), the average length of stay in short-stay hospitals (based on 1967 figures) and hospital days per 100 persons.

Insurance coverage was the percent of the population with coverage.

The correlates were age and family income.

The proportion of each income group that had a physician visit within the past year increased as income increased, as did the proportion using preventive services. The income differential in the use of preventive services was especially marked for children under 17.

Low-income families tended to see physicians in outpatient clinics. The use of physician telephone consultations increased as family income rose. For those under 17, the majority of medical services were telephone consultations. Home visits predominated among persons over 65 years of age.

Dental utilization was directly related to income, especially children's utilization. This relationship was less attenuated because this service is less affected by welfare and insurance programs.

Examination of the hospital discharge rates (for 1966 before Medicare) revealed three well-defined trends: a similar low rate for those under 17, a general trend for hospitalization to decrease as income increased during the working age, 17-64, and finally an upward trend by income in the group 65 and older. After Medicare in 1967, the discharge rate was up and all the income groups exhibited about the same level, approximately 20 discharges per 100 persons.

Patterns for average length of stay and days per 100 persons were variable.

The higher income groups had a significantly larger percentage with hospital insurance coverage than did the low-income categories.

199. White, H. A., et al., 1970. "Use of the emergency room in a community hospital." Pub. Health Rep. 85 (February): 163-168.

This study described and rated the utilization patterns in a municipal hospital emergency room.

Interviews with all patients using the emergency room at Saginaw (Michigan) General Hospital in October, 1966 and in January and April, 1967 provided the data.

The use of the hospital emergency room was the utilization index.

The correlate was the urgency rating of the presenting complaint.

A cross-tabulation of percentages was used to analyze the data.

Contrary to findings from previous studies, findings in this study demonstrated that patients in the Saginaw General Hospital emergency room did not make inappropriate use of the facility.

Over 60 percent of the cases were rated emergent, requiring immediate medical attention, or urgent, requiring medical attention within a few hours.

200. Williams, R., 1966. "A comparison of hospital utilization and costs by types of coverage." Inquiry 3 (September): 28-42.

This study examined the impact of various types of health insurance coverage on use.

Records of participants in five Blue Cross plans provided the data.

The utilization indices were admissions per 1000 members, the average length of stay and patient-days per 1000 members.

The correlates were types of insurance coverage, including full payment, deductible and co-payments.

A cross-tabulation of percentage distributions was used to analyze the data.

Deductibles in insurance plans had a minimal effect in reducing utilization. The data on co-payment coverage, however, indicated that this type of coverage kept down admission and patient-day rates, though its effect on length of stay was negligible.

The omission of one-day stays from the calculations and the failure to consider the different effects of diagnoses prevent conclusive interpretations of these results.

201. Wingert, W. A., et al., 1968. "The influence of family organization on the utilization of pediatric emergency services." Pediatrics 42 (November): 743-751.

This study assessed the impact of family organization or disorganization on the utilization of pediatric emergency services.

Interviews with 22 percent of the people responsible for bringing a child to the emergency room of the Pediatric Ambulatory Department of the Los Angeles University of California Medical Center from June 14 through September 8, 1968 provided the data.

The utilization indices were 1) the obstetrical facilities used for delivery of the patient, 2) the number of outpatient department visits, 3) sources of medical care for the child, 4) the child's immunization status and 5) the usual source of medical advice.

The correlate was a measurement of whether the child was part of a broken or an intact family based on who the child lived with, the marital status of that person, the employment status of the father or surrogate, and whether or not the family was on welfare.

A Chi-square test of significance was performed on the data.

The findings indicated that the patterns of medical care for children from broken, lower socio-economic families did not differ significantly from that of intact families.

The authors explained that perhaps stability and intactness are not synonymous. They suggest that broken families may be quite stable in regard to child health care because of hidden family arrangements not

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specified in the variables, because of guidance from outside agencies or because of norms that assign medical and nursing care to the mother.

202. Winkelstein, W., Jr. and S. Graham 1959. "Factors in participation in the 1954 poliomyelitis vaccine field trials, Erie County, New York." Amer. J. Pub. Health 49 (November): 1454-1466.

This study assessed the characteristics of participants and non-participants in polio vaccine trials.

School records of 54,435 children, grades one through three, in Erie County, New York and census tract data provided the data.

The utilization index was the percentage of children participating in the polio vaccine field trial.

The correlates were race, age, geographic location, economic differences, education of parents, ethnic background, enrollment in public or parochial schools, and previous experience with poliomyelitis.

A cross-tabulation of percentage distributions was used to analyze the data.

Findings reveal that:

- 1) Nonwhites participated more than whites.
- 2) Participation declined as age increased.
- 3) Children living outside Buffalo participated more than those in the city.
- 4) Participation increased as economic status increased.
- 5) There was a direct relationship between the education of the parents and participation.
- 6) The relationship of ethnic background to participation was difficult to assess because of the interaction of the class variable.
- 7) Children in parochial schools participated more than those in public schools.
- 8) In townships outside Buffalo, there was a direct relationship between participation and incidence of polio.

203. Wirick, G. C., 1966. "A multiple equation model of demand for health care." Health Services Research 1 (Winter): 301-346.

This study formulated a simultaneous-equation model for the demand for health care.

Data came from household interviews with a multi-stage area probability sample of members in 2500 households in Michigan in 1958.

(See Table 1, page 104).

The multi-equation model demonstrated some advantage over the single-equation model, strongly evidenced by joint dependency among the different types of medical services sought.

High users of hospital services were also high users of physician services. The number of doctor visits was the best single predictor of use of prescribed drugs. Age and hospital days were most saliently related to other medical expenses.

The importance of such economic and cultural factors as age, family income and education, however, resulted in somewhat different patterning for dental use than that of the hospital and physician components.

The author points out that "the number of doctor visits turned out to be the key variable in three of the equations in addition to being the dependent variable on its own. The hypothesis that the doctor is the key motivator of most health care appears to be well supported."

The author suggests that further research should focus on the interdependency and interaction among the different components of medical care and their correlates because of their high degree of joint dependency.

204. Wirick, G. C., 1962. "Population survey: health care and its financing." In McNerny, W. J., et al. *Hospital and Medical Economics*. Chicago: Hospital Research and Educational Trust.

One survey person in eight was hospitalized. One in six of the aged and one of four females of childbearing years were hospitalized demonstrating that age and sex were the principal determinants of hospital use.

Neither local availability of medical facilities (measured by the ratio of hospital beds and physicians per capita) nor rural-urban distributions within the communities influenced the percentage of the population using hospitals.

Persons with higher degrees of hospital insurance coverage had almost twice the admission rates of those without coverage. The author points out, however, that after adjustment for demographic factors, admission rates decreased as income increased up to the highest income group. This high-income group had above average admission rates, although the highest adjusted admission rates were found in the lowest income groups.

A greater frequency of hospitalization for surgery among those with coverage accounted for the higher percentage of hospitalization for those with insurance compared to those without insurance. The author suggests that the data cannot determine whether this finding represents underuse of those without coverage or overuse of those with coverage or both. When length of stay measurements are considered, however, the data does suggest that those with protection take more advantage of hospital care than those without it.

Table 1. Hypothetical Structure of the Demand for Medical Care as a Multi-Equation System

		Component of Demand				
Aspect of Demand Expressed by the Variable	Hospital Care (Number of days in hospital during the year)	Doctor Care (Number of visits, excluding those for injections only)	Dental Care (Total number of visits during the year)	Prescribed Medicine (Total amount of expenditures on prescribed medicine)	Other Expenses Total expenses, including those for prescribed medicine)	
Physiologic need	Age Sex	Age Sex	Age Sex	Age Sex	Age Sex	
Realization of need	Home care Prescribed medicine	Attitude to early care Hospital days	Attitude to early care Education of head	Attitude to early care	Family size Early environment of family head	
Resources	Insurance Liquid assets	Adj. income Inst. debt	Family income Liquid assets	Family income Inst. debt	Insurance Adj. income	
Motivation	Doctor visits	Unmet needs	Family size Doctor visits	Doctor visits	Hospital days	
Availability of service	Index	Index	Community income level	-	-	

The average length of stay was 7.8 days for the entire population with males averaging 9.3 days and females 7.1 days. The difference was largely due to short-stay maternity cases. Length of stay tended to vary, as did the percentage of persons hospitalized, with age and sex and to some extent with income. However, little tendency could be observed for persons with coverage to have longer stays once they were in the hospital than those without coverage, except in maternity cases. Length of stay was influenced by availability of facilities.

Low-income families consumed more hospital care per capita than higher income families as a result of higher admission rates and somewhat longer lengths of stay.

Relative to doctor and dentist use, two out of three persons received services from a doctor during the year and one out of three visited a dentist. The percentage seeing the doctor was substantially higher for children than for adults and greater for persons in high-income families than for those in low-income families. The number of dental visits was also markedly higher for the individuals in higher income families.

The percentage of children making numerous (six or more) office visits to the doctor was substantially below that of adults. The percentage of persons 65 and over receiving more than one house call by the doctor was substantially above that of other age groups.

On the average there were 5.6 visits to the doctor and/or dentist per person during the year, of which 5.4 were office visits and 0.2 at home. The average number of visits tended to be somewhat higher for the very lowest and the very highest income groups than for those in between.

About one-fourth of the survey population did not see any medical or dental practitioner. The number of different medical practitioners seen during the year averaged about 1.4 per person. About one-half the patient-practitioner contacts were with physicians and about one-fourth with dentists. The rest were scattered among clinics, osteopaths, chiropractors and others.

Other findings implied that increasing medical facilities in an area would not necessarily lead people in that area to seek more medical care.

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Relative to other services received, about one-half of the persons in the sample reported that they received no other types of medical services during the year. Over one-third received prescribed medicines and about one in eight had some eye care. One person in twelve received injections of some kind, largely polio and influenza vaccines.

205. Yankauer, A., *et al.*, 1953. "An evaluation of prenatal care and its relationship to social class and social disorganization." Amer. J. Pub. Health 43 (August): 1001-1010.

This study assessed the characteristics of patients receiving prenatal care.

The clinic records of maternity cases in Community Hospital, Rochester, New York over a two-month period supplied the data.

A study group composed of women who neglected to seek care until late in pregnancy and a control group composed of women of similar socio-economic status whose prenatal care was adequate comprised the utilization measures.

The correlates were degrees of social disorganization: out-of-wedlock births, mobility and welfare dependency.

A Chi-square test of significance was used to analyze the data.

The study group women demonstrated a greater degree of social disorganization than the control group women. Women who neglected to seek early prenatal care had a greater number of out-of-wedlock pregnancies, greater mobility and fertility and a greater degree of welfare dependency.

The authors suggest that the failure to seek prenatal care (and an accompanying "pregnancy wastage") may be outward manifestations "of the rejection of pregnancy and the loss of a sense of personal dignity. These attributes affect the fetus adversely by way of maternal nutrition and pattern of living."

206. Yankauer, A., *et al.*, 1958. "Social stratification and health practices in childbearing and childrearing." Amer. J. Pub. Health 48 (June): 732-741.

This study assessed the different childbearing and childrearing practices of mothers from different social classes. Only that data concerned with childbearing is summarized here.

Interviews with a selected sample of 1433 mothers in scattered areas of New York state supplied the data.

The utilization indices were trimester in which prenatal care was sought, the type of physician rendering care during the prenatal period and a postnatal medical exam of the mother.

Social class was the correlate.

A cross-tabulation of percentage distributions was employed to analyze the data.

Most mothers sought prenatal care early in pregnancy. However, the lower social class mothers did have a tendency to delay longer.

Medical care during pregnancy was provided largely by specialists to the higher social classes and largely by general practitioners to the lower social classes.

The seeking of postnatal care declined markedly as social class declined.

207. Yeracaris, C. 1962. "Social factors associated with the acceptance of medical innovations: a pilot study." J. Health Hum. Behav. 3 (Fall). 193-198.

This study appraised the social factors associated with the acceptance of a particular preventive health practice.

Interviews with a sample of 550 parents of students in 2 high schools of 2 different socio-economic status levels in Buffalo, New York provided the data.

The utilization index was the percentage of parents giving permission for freshman and senior high school students to take the tuberculin skin test.

The correlates were education, race and religion of parents; socio-economic status of the high school, polio vaccination status of respondents' children and whether or not the respondents themselves favored the vaccination; and whether or not the respondents favored chest X-ray exams.

A Chi-square test of significance was used to analyze the data.

Different cultural factors and health behaviors are likely to differentially affect the acceptance of preventive health practices.

The number of years of schooling attained by the parent was directly related to whether permission was given. The rate of acceptance of nonwhites in the lower status school was significantly lower than the rate of white respondents.

Statistically significant differences were also revealed among the different religious groups in each school.

Receipt of a polio vaccination was also related to acceptance of the TB test, as was whether or not a chest X-ray had been obtained.

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PUBLIC HEALTH SERVICE  
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